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p3E1.2 deletion series plasmids and excision assay results

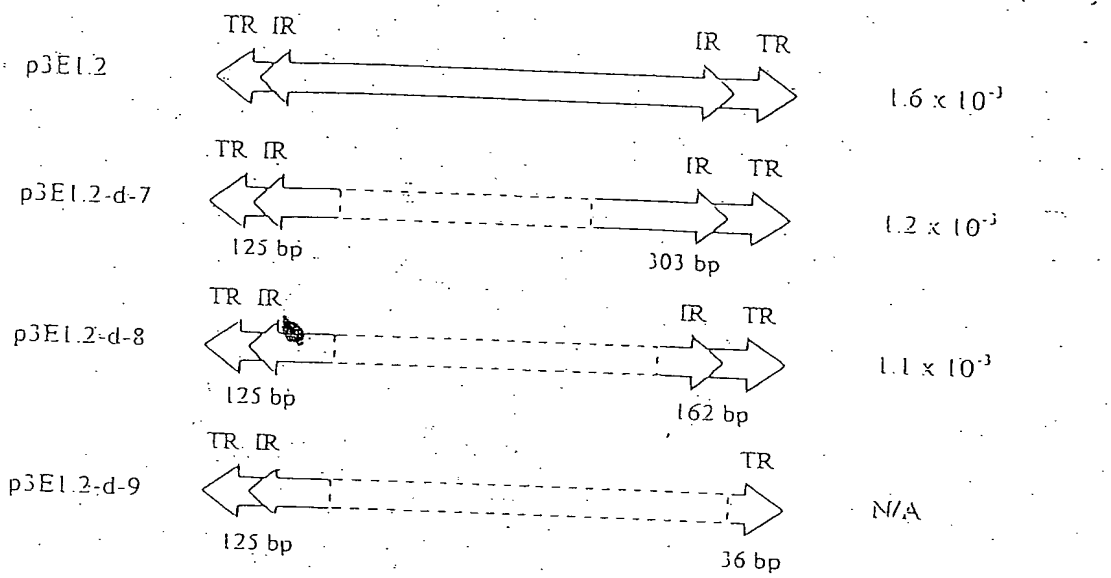


FIG. 1

FIG 2(A)

Plasmids	Insertion Sequence	IPTA Frequency
pIAO-P/L-TTAA	TTAA	0
pIAO-P/L-TTAA2	TTAATTAA	0
pIAO-P/L	TTAATCTAGAGGATCCTCTAGATTAA (*XbaI/BamHI/XbaI*) (SEQ ID NO: 35)	4 x 10^{-7}
pIAO-P/L-18 bp	TTAATCTAGACGTACGCGGAGCTTAA (SEQ ID NO: 36)	1.0 x 10^{-6}
pIAO-P/L-22 bp	TTAATCTAGCTAGTACTAGAACTAGATTAA (SEQ ID NO: 37)	3.6 x 10^{-6}
pIAO-P/L-40 bp	TTAATCTAGTTCTAGACGTACGCGGCGCACTAGTACTAGCTAGATTAA (SEQ ID NO:38)	2.5 x 10^{-5}
pIAO-P/L-55 bp	TTAATCTAGTTCTAGACTGCGCGTCTCTAGACGTACGCGGCGCACTA-GTACTAGCTAGATTAA (SEQ ID NO: 39)	1.2 x 10^{-4}
pIAO-P/L-73 bp	63 bp of Lambda *PvuII* fragment between *XbaI* sites of pIAO-P/L	1.3 x 10^{-4}
pIAO-P/L-212 bp	63 bp + 141 bp of Lambda *PvuII* fragment between *XbaI* sites of pIAO-P/L	3.1 x 10^{-4}
pIAO-P/L-354 bp	43 bp of Lambda *PvuII* fragment between *XbaI* sites of pIAO-P/L	2.9 x 10^{-3}
pIAO-P/L-589 bp	579 bp of Lambda *PvuII* fragment between *XbaI* sites of pIAO-P/L	3.2 x 10^{-3}
pIAO-P/L-2.2 kb	2.2 kb of Lambda *HindIII* fragment between *XbaI* sites of pIAO-P/L	3.4 x 10^{-4}

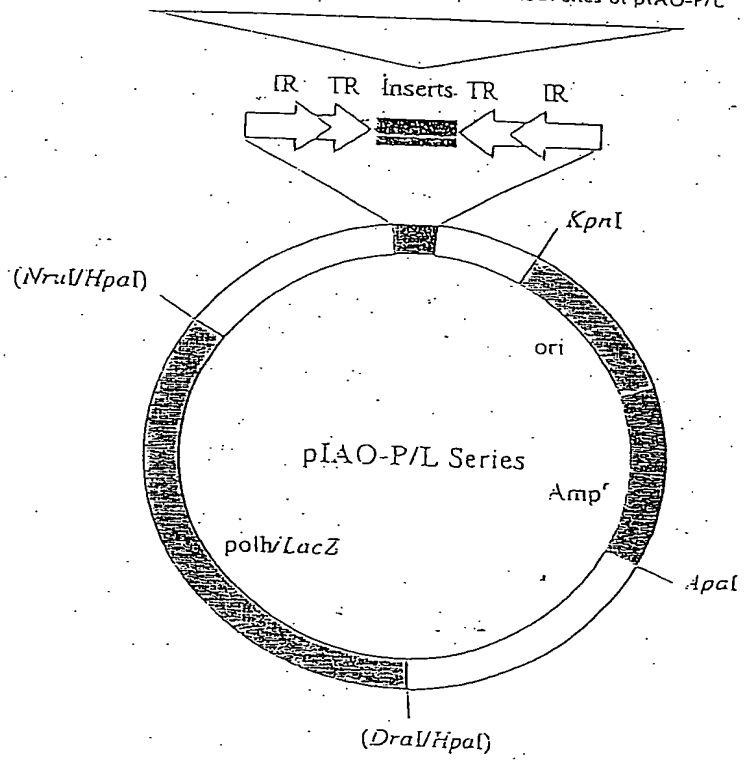


FIG. 2(B)

Sequence Range: 1 to 7670

100

AACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCAC
TGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGC

200

TCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAG

>Ori

300

GCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAA
ATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAA

400

GATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCT
GCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGT

500

GGCGCTTTCTCAATGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCT
CCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGC

600

TGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTAT
CGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGT

700

ATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAG
AAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTT

800

CGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGG
TGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGA

FIG. 2(C1)

900

TCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAA
ACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCT

1000

TCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATA
TGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGC
<W H K I L S A
<_____AMP RESIST_____

1100

ACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCG
TGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGT
<G I E A I Q R N R E D M T A Q S G T T Y I V V I R S P K G D
P G L
<_____AMP
RESIST_____

1200

GCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATA
AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTT
<A A I I G R S G R E G A G S K D A I F W G A P L A S R L L P
G A V K
<_____AMP
RESIST_____

1300

TATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTC
GC
CAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCAT
<D A E M W D I L Q Q R S A L T L L E G T L L K R L T T A M
A V P M
<_____AMP
RESIST_____

1400

FIG. 2(C1)

CGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGAT
CAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTT
<T T D R E D N P I A E N L E P E W R D L R T V H D G M N H
L F A T
<_____AMP
RESIST_____

1500

AGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCAC
TCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCAT
<L E K P G G I T T L L L N A A T N D S M T I A A S C L E R V
T M G D
<_____AMP
RESIST_____

1600

CCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATA
GTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGA
<T L H K E T V P S Y E V L D N Q S Y H I R R G L Q E Q G A
D I R S
<_____AMP
RESIST_____

1700

TAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCT
TCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGT
<L V A G C L L V K F T S M M P F R E E P R F S E L I K G S N
L D L
<_____AMP
RESIST_____

1800

TCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAG
CGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAA
<E I Y G V R A G L Q D E A D K V K V L T E P H A F V P L C F
A A F F

FIG. 2(C1)

<_____AMP
RESIST_____

1900

AGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATA
TTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACAT
<P I L A V R F H Q I S M (SEQ ID NI: 58)
<_____AMP RESIST_____

2000

ATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGA
AAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATTA

2100

ACCTATAAAAATAGGCGTATCACGGGGCCCTGAGGTGAACCAATTGTCACACGT
AATATTACGACAACTACCGTGCACAGGCTTTGATAACTCCTTCACG
<R Y F Y A Y * P A R L H V L Q * V Y Y * S L * R A C A K I V
G E R
<_____ORF1 N-TERM
[SPLIT]_____

2200

TAGTATTCACCGAGTGGTACTCCGTTGGTCTGTGTTCCTCTTCCCAAATAAGGCAT
TC
CATTTATCATATACTTCGTACCACTGTCACACATCATGAGGA
<L I * R T T S R Q D T N R K G F L A N W K D Y V E Y W Q *
V D H P
<_____ORF1 N-TERM
[SPLIT]_____

2300

TTTTTATTCCATACTTACTTGGCTTGTTTGGGATATACATCCTAAACGGACACCGT
CCTCTAAAACCAAGTAACTGTTCATCTATGGTCAAATGAGCCCC
<N K N W V * K A Q K P Y V D * V S V T R * F W T V T * R H
D F S G R
<_____ORF1 N-TERM
[SPLIT]_____

FIG. 2(C1)

2400

TGGAGTGTAATTTTGTATGCACTGATGGATAAAGAGATCCCATATTTTTCTAACA
GGAGTAAATACATCGTTTTCTCGAAGTGTGGGCCGTATACTTTTG
<S H L K T H V S P Y L S G M N K * C S Y I C R K R S T H A
T Y K Q
<_____ORF1 N-TERM
[SPLIT]_____

2500

TCATCCATTCTAAGACATCGTATCAAAAAATCCAAAACGATCCACAGACTCATTA
CAGAGACGTACACATTGACAAAGATCGATCCAAAGAGGTCATCTG
<* G N * S M T D F F G F R D V S E N C L R V C Q C L D I W L
P * R
<_____ORF1 N-TERM
[SPLIT]_____

2600

TGGACATGTGGTTATCTTTTCTCACTGCTGTCATTACCAGAATACCAAAGAAAGC
ATAGATTTCATCTTCATTCGTGTCACGAAATGTAGCACCTGTCAT
<H V H P * R K E S S D N G S Y W L F C L N * R * E H * S I Y
C R D Y
<_____ORF1 N-TERM
[SPLIT]_____

2700

AGATTCCCGACGTTTCAATGATATCTCAGCATTTGTCCATTTTACAATTTGCGAAA
TTATCTCATCAGTAAAAAAATAGTTTGAAGCATAAAAGTGGGTCA
<I G S T E I I D * C K D M K C N A F N D * * Y F I T Q L M F
T P *
<_____ORF1 N-TERM
[SPLIT]_____

2800

TATATATTGCGGCACATACGCGTCGGACCTCTTTGAGATCTGACAATGTTCAGTG
CAGAGACTCGGCTACCGCTCGTGGACTTTGAAGTTAAATTCAGAT
<I Y Q P V Y A D S R K S I Q C H E T C L S P * R E H V K F N (SEQ ID NO: 59)

FIG. 2(C1)

<_____ORF1 N-TERM
[SPLIT]_____

2900

ATAAAGACGCTGAAAATCATTTGATTTTCGCTCTAACATACCACCCTAAAGATTA
TAAATTTAATGAATTATTAAAATACGTACAACAATTGTCTGTAAA

3000

TCAACAACGCACAGAATCTAGCGCTTAATAAATGTACTAATAACAATGTATCGTG
TTTTAATACGCCGGACCAGTGAACAGAGGTGCGTCTGGTGCAAAC

3100

TCCTTTACTTTGAACACCAGGGAAACTTCAAGGAGAATTTCCTCCTCTTCAGCAG
AGTCGGTACCGGTCACCCGGGGATCCCCCCTGCCCGGTTATTATT

3200

ATTTTTGACACCAGACCAACTGGTAATGGTAGCGACCGGCGCTCAGCTGGAATTC
CGCCGATACTGACGGGCTCCAGGAGTCGTCGCCACCAATCCCCAT
<K Q C W V L Q Y H Y R G A S L Q F E A S V S P S W S D D G
G I G M

<_____LACZ_____

3300

ATGGAAACCGTCGATATTCAGCCATGTGCCTTCTTCCGCGTGCAGCAGATGGCGA
TGGCTGGTTTCCATCAGTTGCTGTTGACTGTAGCGGCTGATGTTG
<H F G D I N L W T G E E A H L L H R H S T E M L Q Q Q S Y
R S I N

<_____LACZ_____

3400

AACTGGAAGTCGCCGCGCCACTGGTGTGGGCCATAATTCAATTCGCGCGTCCCGC
AGCGCAGACCGTTTTCGCTCGGGAAGACGTACGGGGTATACATGT

FIG. 2(C1)

<F Q F D G R W Q H P G Y N L E R T G C R L G N E S P F V Y P T Y M D

<_____LACZ_____

3500

CTGACAATGGCAGATCCCAGCGGTCAAAACAGGCGGCAGTAAGGCGGTCGGGAT
AGTTTTCTTGCGGCCCTAATCCGAGCCAGTTTACCCGCTCTGCTAC
<S L P L D W R D F C A A T L R D P Y N E Q P G L G L W N V R E A V

<_____LACZ_____

3600

CTGCGCCAGCTGGCAGTTCAGGCCAATCCGCGCCGGATGCGGTGTATCGCTCGCC
ACTTCAACATCAACGGTAATCGCCATTTGACCACTACCATCAATC
<Q A L Q C N L G I R A P H P T D S A V E V D V T I A M Q G S G D I

<_____LACZ_____

3700

CGGTAGGTTTTCCGGCTGATAAATAAGGTTTTCCCCTGATGCTGCCACGCGTGAG
CGGTCGTAATCAGCACCGCATCAGCAAGTGTATCTGCCGTGCACT
<R Y T K R S I F L T K G Q H Q W A H A T T I L V A D A L T D A T C Q

<_____LACZ_____

3800

GCAACAACGCTGCTTCGGCCTGGTAATGGCCCGCCGCCTTCCAGCGTTCGACCCA
GGCGTTAGGGTCAATGCGGGTCGCTTCACTTACGCCAATGTCGTT
<L L A A E A Q Y H G A A K W R E V W A N P D I R T A E S V G I D N

FIG. 2(C1)

<_____LACZ_____

3900

ATCCAGCGGTGCACGGGTGAACTGATCGCGCAGCGGCGTCAGCAGTTGTTTTTTA
TCGCCAATCCACATCTGTGAAAGAAAGCCTGACTGGCGGTTAAAT
<D L P A R T F Q D R L P T L L Q K K D G I W M Q S L F G S
Q R N F

<_____LACZ_____

4000

TGCCAACGCTTATTACCCAGCTCGATGCAAAAATCCATTTCGCTGGTGGTCAGAT
GCGGGATGGCGTGGGACGCGGCGGGGAGCGTCACACTGAGGTTTT
<Q W R K N G L E I C F D M E S T T L H P I A H S A A P L T V
S L N E

<_____LACZ_____

4100

CCGCCAGACGCCACTGCTGCCAGGCGCTGATGTGCCCGGCTTCTGACCATGCGGT
CGCGTTCGGTTGCACTACGCGTACTGTGAGCCAGAGTTGCCCGGC
<A L R W Q Q W A S I H G A E S W A T A N P Q V V R V T L
W L Q G A

<_____LACZ_____

4200

GCTCTCCGGCTGCGGTAGTTCAGGCAGTTCAATCAACTGTTTACCTTGTGGAGCG
ACATCCAGAGGCACTTCACCGCTTGCCAGCGGCTTACCATCCAGC
<S E P Q P L E P L E I L Q K G Q P A V D L P V E G S A L P K
G D L

FIG. 2(C1)

<_____LACZ_____

4300

GCCACCATCCAGTGCAGGAGCTCGTTATCGCTATGACGGAACAGGTATTCGCTGG
TCACTTCGATGGTTTGCCCGGATAAACGGAACTGGAAAAACTGCT
<A V M W H L L E N D S H R F L Y E S T V E I T Q G S L R F Q
F F Q Q

<_____LACZ_____

4400

GCTGGTGTTTTGCTTCCGTCAGCGCTGGATGCGGCGTGCGGTCGGCAAAGACCAG
ACCGTTCATACAGAACTGGCGATCGTTCGGCGTATCGCCAAAATC
<Q H K A E T L A P H P T R D A F V L G N M C F Q R D N P T
D G F D

<_____LACZ_____

4500

ACCGCCGTAAGCCGACCACGGGTTGCCGTTTTCATCATATTTAATCAGCGACTGA
TCCACCCAGTCCCAGACGAAGCCGCCCTGTAAACGGGGATACTGA
<G G Y A S W P N G N E D Y K I L S Q D V W D W V F G G Q
L R P Y Q

<_____LACZ_____

4600

CGAAACGCCTGCCAGTATTTAGCGAAACCGCCAAGACTGTTACCCATCGCGTGG
GCGTATTCGCAAAGGATCAGCGGGCGCGTCTCTCCAGGTAGCGAAA
<R F A Q W Y K A F G G L S N G M A H A Y E C L I L P R T E
G P L S L

FIG. 2(C1)

<_____LACZ_____

4700

GCCATTTTTTGATGGACCATTTCGGCACAGCCGGGAAGGGCTGGTCTTCATCCAC
GCGCGCGTACATCGGGCAAATAATATCGGTGGCCGTGGTGTCGGC
<W K K I S W K P V A P F P Q D E D V R A Y M P C I I D T A
T T D A

<_____LACZ_____

4800

TCCGCCGCCTTCATACTGCACCGGGCGGGAAGGATCGACAGATTTGATCCAGCG
ATACAGCGCGTCGTGATTAGCGCCGTGGCCTGATTCATTCCCCAGC
<G G G E Y Q V P R S P D V S K I W R Y L A D H N A G H G S
E N G L

<_____LACZ_____

4900

GACCAGATGATCACACTCGGGTGATTACGATCGCGCTGCACCATTCGCGTTACGC
GTTCGCTCATCGCCGGTAGCCAGCGCGGATCATCGGTCAGACGAT
<S W I I V S P H N R D R Q V M R T V R E S M A P L W R P D
D T L R N

<_____LACZ_____

5000

TCATTGGCACCATGCCGTGGGTTTCAATATTGGCTTCATCCACCACATACAGGCC
GTAGCGGTCGCACAGCGTGTACCACAGCGGATGGTTCGGATAATG
<M P V M G H T E I N A E D V V Y L G Y R D C L T Y W L P
H N P Y H

FIG. 2(C1)

<_____LACZ_____

5100

CGAACAGCGCACGGCGTTAAAGTTGTTCTGCTTCATCAGCAGGATATCCTGCACC
ATCGTCTGCTCATCCATGACCTGACCATGCAGAGGATGATGCTCG
<S C R V A N F N N Q K M L L I D Q V M T Q E D M V Q G H L
P H H E

<_____LACZ_____

5200

TGACGGTTAACGCCTCGAATCAGCAACGGCTTGCCGTTCAGCAGCAGCAGACCA
TTTTCAATCCGCACCTCGCGGAAACCGACATCGCAGGCTTCTGCTT
<H R N V G R I L L P K G N L L L L G N E I R V E R F G V D C
A E A E

<_____LACZ_____

5300

CAATCAGCGTGCCGTCGGCGGTGTGCAGTTCAACCACCGCACGATAGAGATTCG
GGATTTCGGCGCTCCACAGTTTCGGGTTTTCGACGTTCAGACGTAG
<I L T G D A T H L E V V A R Y L N P I E A S W L K P N E V
N L R L

<_____LACZ_____

5400

TGTGACGCGATCGGCATAACCACCACGCTCATCGATAATTTCACCGCCGAAAGG
CGCGGTGCCGCTGGCGACCTGCGTTTCACCCTGCCATAAAGAAACT
<T V R D A Y G G R E D I I E G G F P A T G S A V Q T E G Q
W L S V

FIG. 2(C1)

<_____LACZ_____

5500

GTTACCCGTAGGTAGTCACGCAACTCGCCGCACATCTGAACTTCAGCCTCCAGTA
CAGCGCGGCTGAAATCATCATTAAAGCGAGTGGCAACATGGAAAT
<T V R L Y D R L E G C M Q V E A E L V A R S F D D N F R T
A V H F D

<_____LACZ_____

5600

CGCTGATTTGTGTAGTCGGTTTATGCAGCAACGAGACGTCACGGAAAATGCCGCT
CATCCGCCACATATCCTGATCTTCCAGATAACTGCCGTCACTCCA
<S I Q T T P K H L L S V D R F I G S M R W M D Q D E L Y S
G D S W

<_____LACZ_____

5700

ACGCAGCACCATCACCGCGAGGCGGTTTTCTCCGGCGCGTAAAAATGCGCTCAG
GTCAAATTCAGACGGCAAACGACTGTCCTGGCCGTAACCGACCCAG
<R L V M V A L R N E G A R L F A S L D F E S P L R S D Q G
Y G V W

<_____LACZ_____

5800

CGCCCGTTGCACCACAGATGAAACGCCGAGTTAACGCCATCAAAAATAATTCGC
GTCTGGCCTTCCTGTAGCCAGCTTTCATCAACATTAAATGTGAGCG
<R G N C W L H F A S N V G D F I I R T Q G E Q L W S E D V
N F T L S

FIG. 2(C1)

<_____LACZ_____

5900

AGTAACAACCCGTCGGATTCTCCGTGGGAACAAACGGCGGATTGACCGTAATGG
GATAGGTTACGTTGGTGTAGATGGGCGCATCGTAACCGTGCATCTG
<Y C G T P N E T P V F P P N V T I P Y T V N T Y I P A D Y G
H M Q

<_____LACZ_____

6000

CCAGTTTGAGGGGACGACGACGGGATCCGTTTTTTTATTACAAAACTGTTACGAA
AACAGTAAAATACTTATTTATTCGGACCAACAATGTTTATTCTTA
<V L L T * E *
<___ORF1 N-TERM [S____
<W N S P V V V P D T K K N C F Q * S F L L I S I * E S W C(SEQ ID NO: 6C

<_____LACZ_____

6100

CCTCTAATAGTCCTCTGTGGCAAGGTCAAGATTCTGTTAGAAGCCAATGAAGAAC
CTGGTTGTTCAATAACATTTTGTTCGTCTAATATTTCACTACGCT
<R * Y D E T A L D L N Q * F G I F F R T T * Y C K T R R I N
* * A
<_____ORF1 N-TERM
[SPLIT]_____

6200

TGACGTTGGCTGACACTTCATGTACCTCATCTATAAACGCTTCTTCTGTATCGCTC
TGGACGTCTTCACTTACGTGATCTGATATTTCACTGTCAGAATC
<Q R Q S V S * T G * R Y V S R R Y R E P R R * K R S R I N *
Q * F G
<_____ORF1 N-TERM
[SPLIT]_____

FIG. 2(C1)

6300

CTCACCAACAAGCTCGTCATCGCCTTGCAGAAGAGCAGAGAGGATATGCTCATC
GTCTAAAGAACATCCCATTTTATTATATATTAGTCACGATATCTAT
<* W C A R * R R A S S C L P Y A * R R F F M G X (SEQ ID NO: 61)
<_____ORF1 N-TERM
[SPLIT]_____

6400

AACAAGAAAATATATATATAATAAGTTATCACGTAAGTAGAACATGAAATAACA
ATATTAATTATCGTATGAGTTAAATCTTAAAAGTCACGTAAAAGAT

6500

AATCATGCGTCATTTTGACTCACGCGGTCGTTATAGTTCAAAATCAGTGACACTT
ACCGCATTGACAAGCACGCCTCAGCCGAGCTCCAAGCGGCGACTG

6600

AGATGTCCTAAATTGCAAACAGCGACGGATTCGCGCTATTTAGAAAGAGAGAGC
AATATTTCAAGAATGCATGCGTCAATTTTACGCAGACTATCTTTCT
____RIGHT TERMINAL
REPEAT_____>

6700

AGGGTTAATCTAGAGGATCCTCTAGATTAACCCTAGAAAGATAATCATATTGTGA
CGTACGTTAAAGATAATCATGCGTAAAATTGACGCATGTGTTTTT
____>
_____LEFT TERMINAL
REPEAT_____>

6800

ATCGGTCTGTATATCGAGGTTTATTTATTAATTTGAATAGATATTAAGTTTTATTA
TA
TTTACACTTACATACTAATAATAAATTCAACAAACAATTTAT

6900

TTATGTTTATTTATTTATTAAAAAAAAACAAAAACTCAAAATTTCTTCTAAAGTA
ACAAAACTTTTAAACATTCTCTCTTTTACAAAAATAAACTTATTT

FIG. 2(C1)

7000

TGTACTTTAAAAACAGTCATGTTGTATTATAAAATAAGTAATTAGCTTAACTTAT
ACATAATAGAAACAAATTATACTTATTAGTCAGTCCAGAAACAAC
<D T W F C S
<___ORF1 C-TER____

7100

TTTGGCACATATCAATATTATGCTCTCGACAAATAACTTTTTTGCATTTTTTGCAC
GATGCATTTGCCTTTCGCCTTATTTTAGAGGGGCAGTAAGTACA
<Q C M D I N H E R C I V K K C K K C S A N A K R R I K S P
C Y T C
<_____ORF1
C-TERM_____

7200

GTAAGTACGTTTTTTCATTACTGGCTCTTCAGTACTGTCATCTGATGTACCAGGCA
CTTCATTTGGCAAAATATTAGAGATATTATCGCGCAAATATCTC
<Y T R K K M V P E E T S D D S T G P V E N P L I N S I N D R
L Y R
<_____ORF1
C-TERM_____

7300

TTCAAAGTAGGAGCTTCTAAACGGTTACGCATAAACGATGACGTCAGGCTCATGT
AAAGGTTTCTCATAAATTTTTTGCGACTTTGAACCTTTTCTCCCT
<K L T P A E L R N R M F S S T L S M Y L N R M F K K R S Q
V K E G K
<_____ORF1
C-TERM_____

7400

TGCTACTGACATTATGGCTGTATATAATAAAAGAATTTATGCAGGCAATGTTTAT
CATTCCGTACAATAATGCCATAGGCCACCTATTCGTCTTCCTACT
<S S V N H S Y I I F S N I C A I N I M G Y L L A M P W R N T
K R S
<_____ORF1
C-TERM_____

FIG. 2(C1)

7500

GCAGGTCATCACAGAACACATTTGGTCTAGCGTGTCCACTCCGCCTTTAGTTTGA
TTATAATACATAACCATTTGCGGTTTACCGGTACTTTCGTTGATA
<C T M V S C M Q D L T D V G G K T Q N Y Y M V M Q P K G
T S E N I
<_____ORF1
C-TERM_____

7600

GAAGCATCCTCATCACAAGATGATAATAAGTATACCATCTTAGCTGGCTTCGGTT
TATATGAGACGAGAGTAAGGGGTCCGTCAAAACAAAACATCGATG
<S A D E D C S S L L Y V M K A P K P K Y S V L T L P G D F C
F M S T
<_____ORF1
C-TERM_____

TTCCCACTGGCCTGGAGCGACTGTTTTTCAGTACTTCCGGTATCTCGCGTTTGTTT
GATCGCACGGTACC (SEQ ID NO: 57)
<G V P R S R S N K L V E P I E R K N S R V T G (SEQ ID NO: 62)
<_____ORF1
C-TERM_____

FIG. 2(C1)

FIG. 2(c2)

pIAO-P/L-Lambda-2.2kb

Sequence Range: 1 to 9994

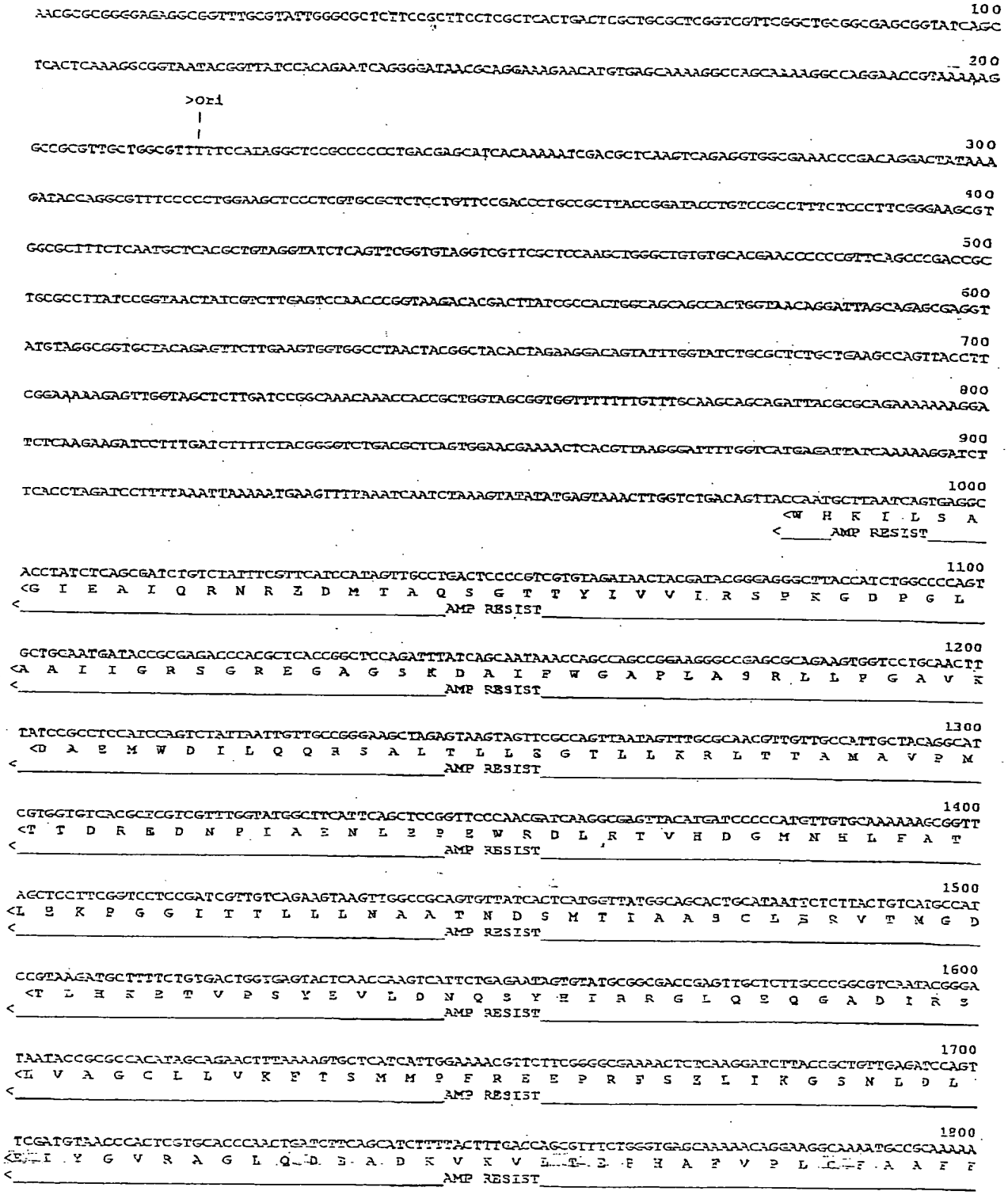
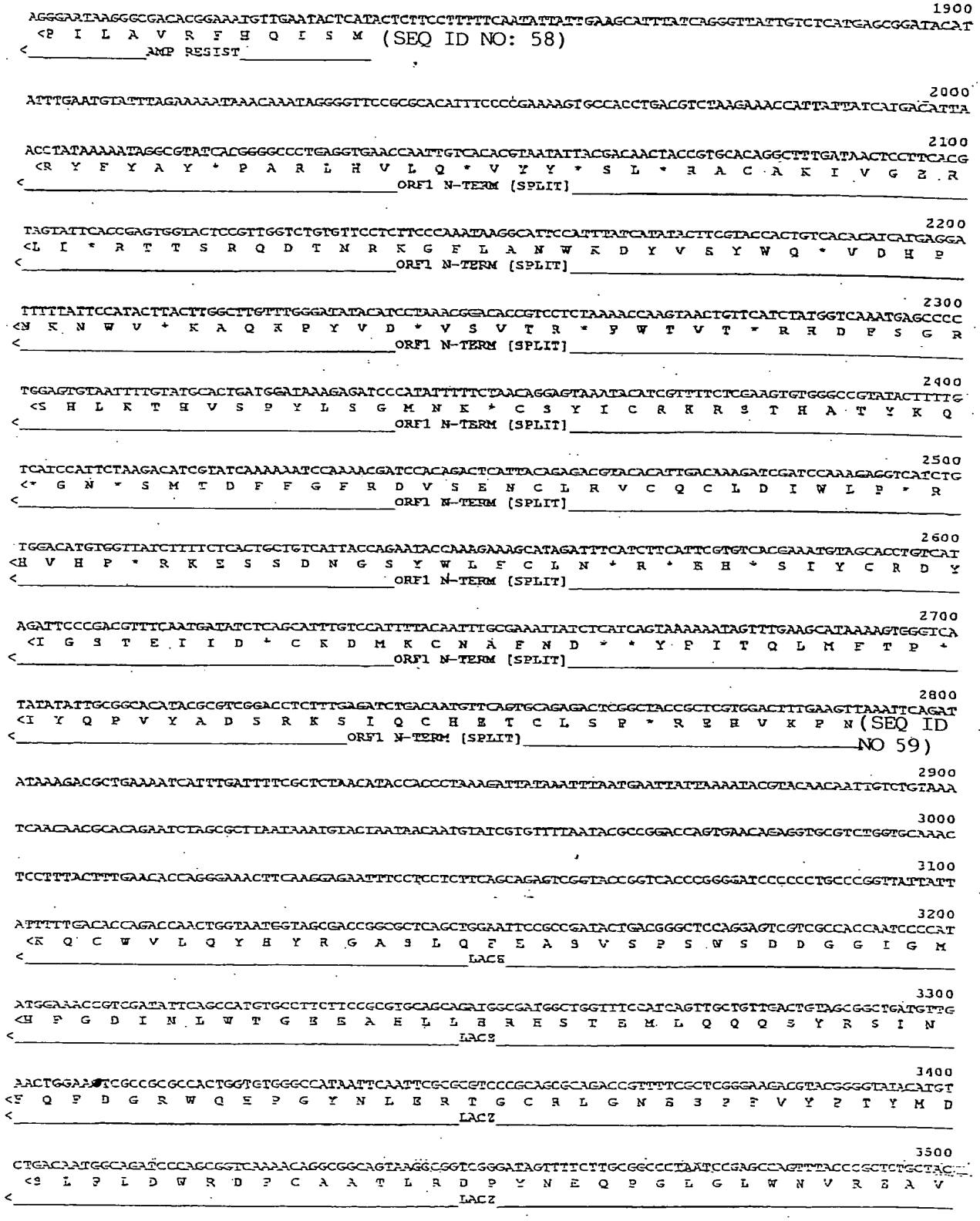


FIG. 2(C2) cont.



(SEQ ID NO: 58)

(SEQ ID NO 59)

FIG. 2(C2) cont.

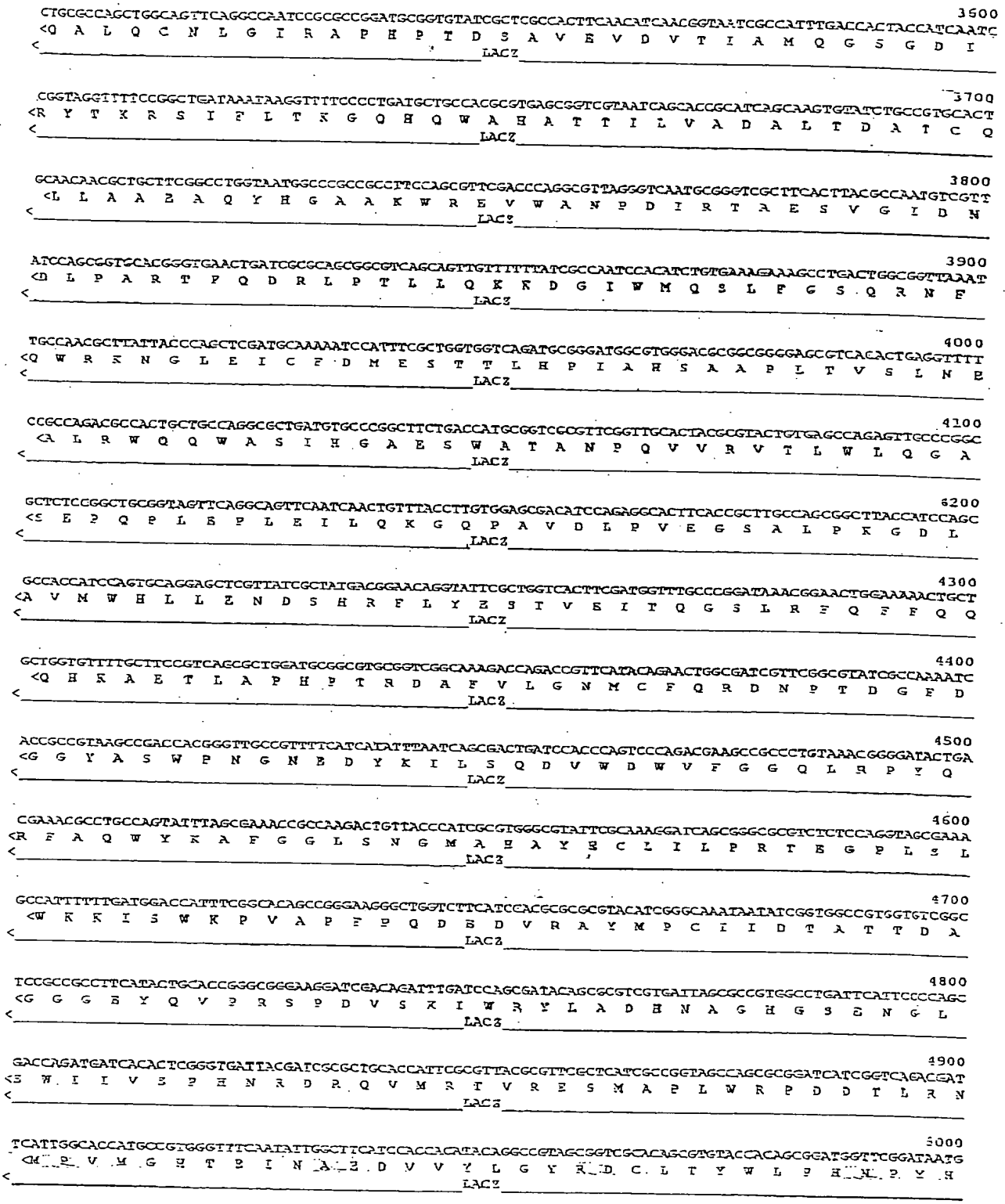

3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
LACZ

FIG. 2(C2)

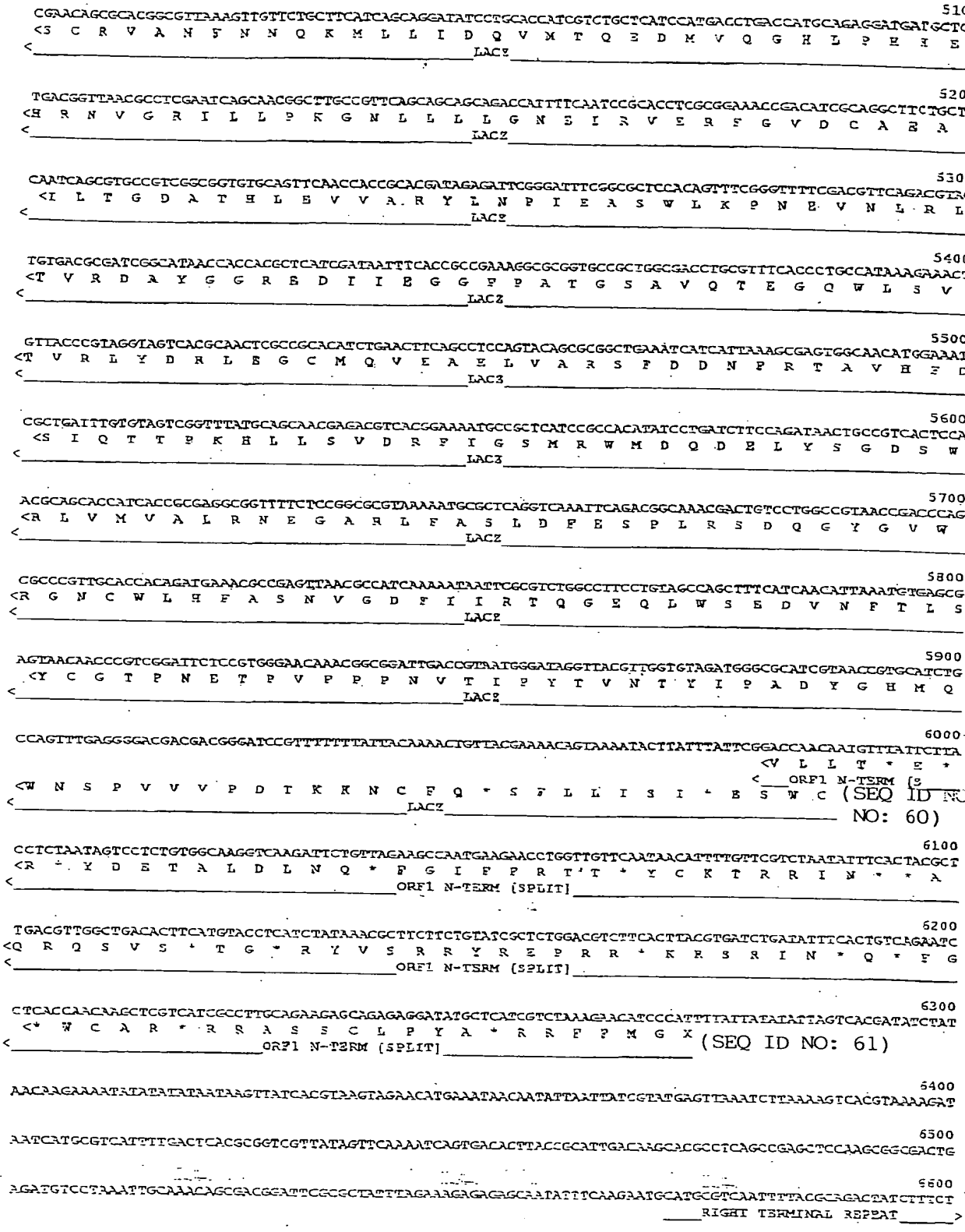

5100
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6300
6400
6500
6600
LACZ
ORF1 N-TERM (SPLIT)
RIGHT TERMINAL REPEAT
(SEQ ID NO: 60)
(SEQ ID NO: 61)

FIG. 2(C2) cont.

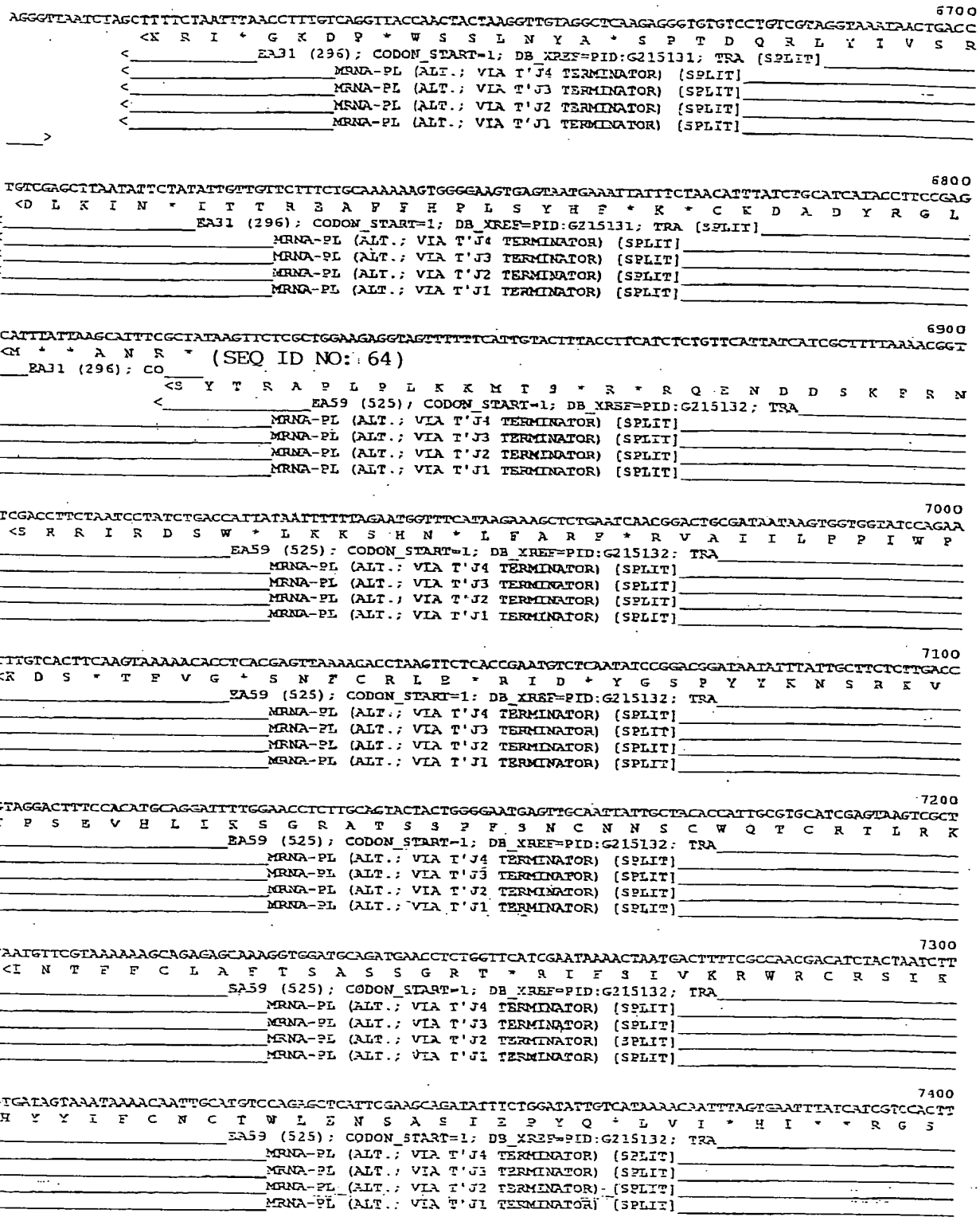

6700
6800
6900
7000
7100
7200
7300
7400
(SEQ ID NO: 64)
EA31 (296); CODON_START=1; DB_XREF=PID:GZ15131; TRA [SPLIT]
EA59 (525); CODON_START=1; DB_XREF=PID:GZ15132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]

FIG. 2(C2) cont.

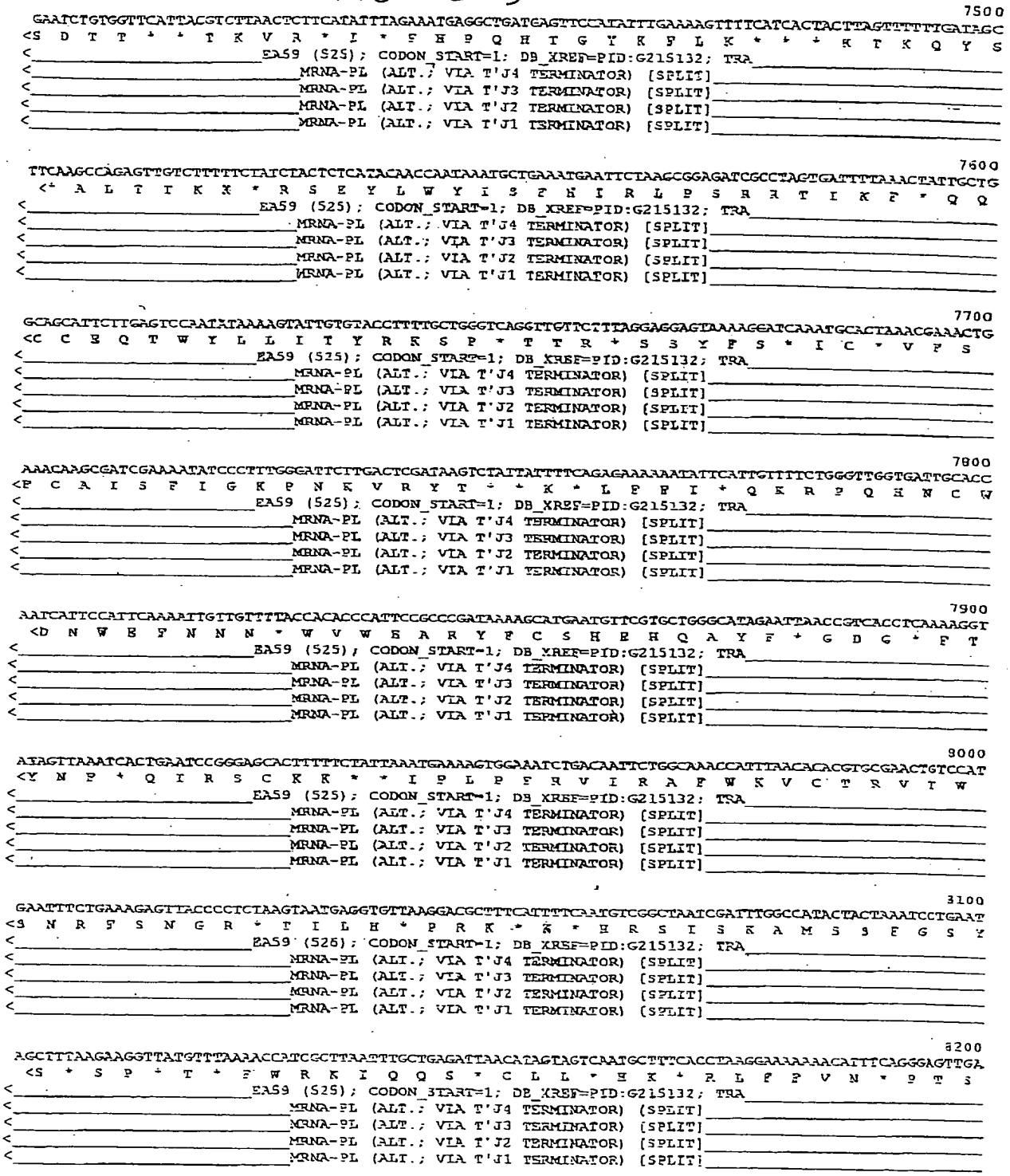
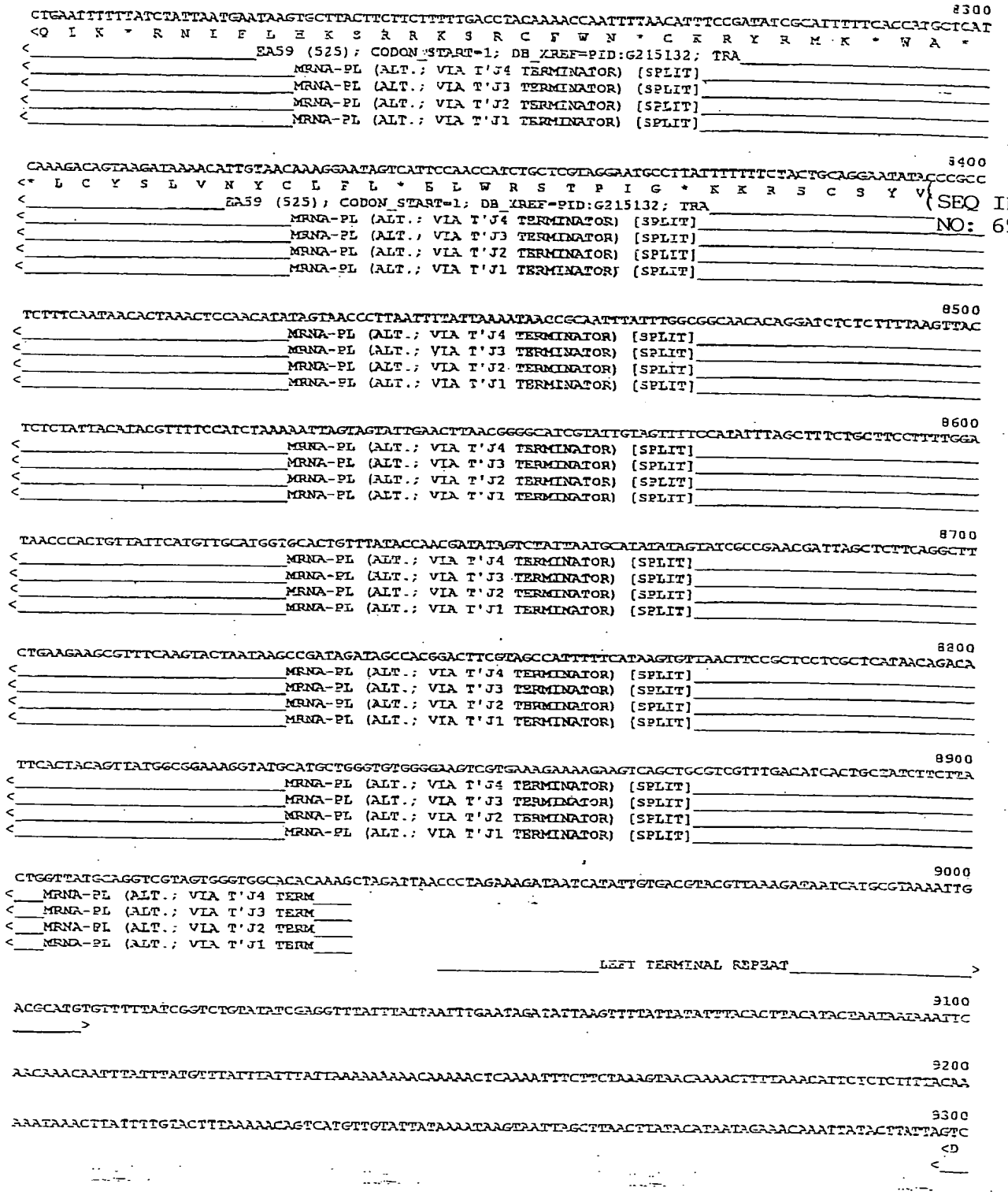
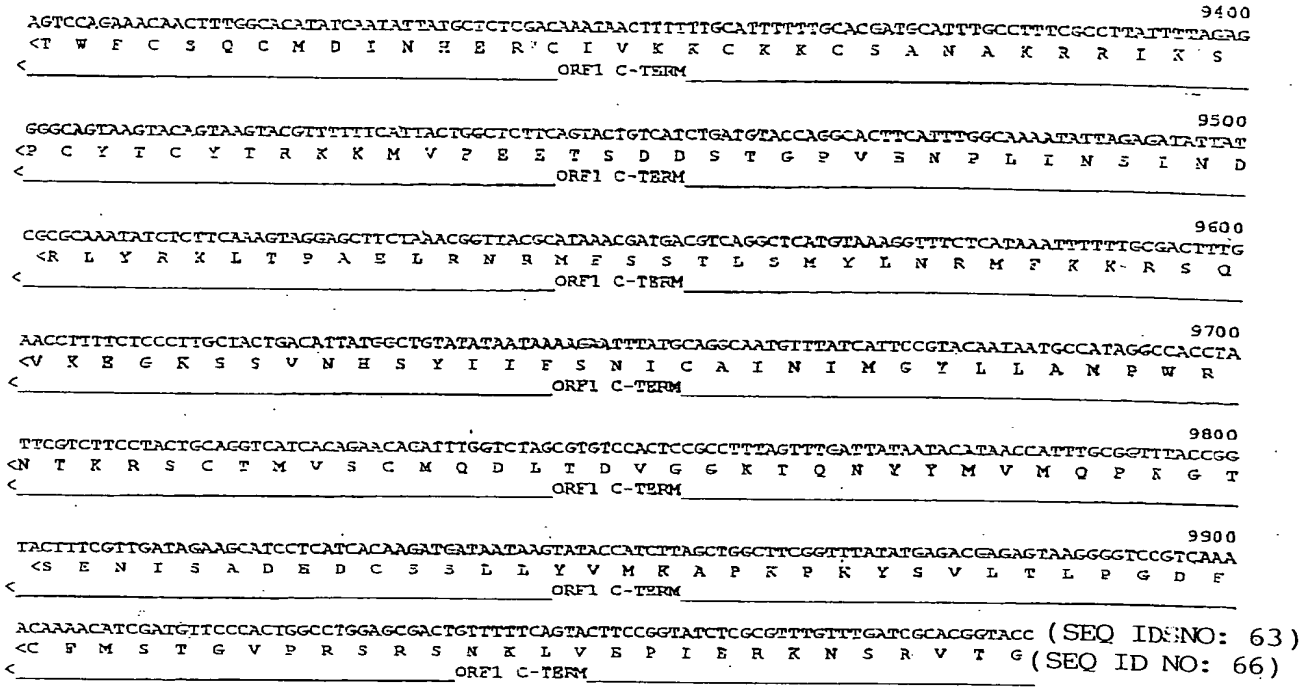

7500
GAATCTGTGGTTCATTACGTCTTAACTCTTCATATTTAGAAATGAGGCTGATGAGTTCCATATTTGAAAAGTTTTCATCACTACTTAGTTTTTTGATAGC
<S D T T * * T K V R * I * F H P Q H T G Y K F L K * * * K T K Q Y S
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
7600
TTCAAGCCAGAGTTGTCTTTTTCTATCTACTCTCATACAACCAATAAATGCTGAAATGAATTCTAAGCGGAGATCGCCTAGTGATTTTAAACTATTGCTG
<* A L T I K X * R S E Y L W Y I S F N I R L P S R R T I K F * Q Q
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
7700
GCAGCATTCTTGAGTCCAATATAAAAGTATTGTGTACCTTTTGCTGGGTCAGGTTGTTCTTTAGGAGGAGTAAAAGCATCAAATGCACTAAACGAAACTG
<C C E Q T W Y L L I T Y R K S P * T T R * S S Y F S * I C * V F S
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
7800
AAACAAGCGATCGAAAATATCCCTTTGGGATTCTTGACTCGATAAGTCTATTATTTTCAGAGAAAAAAATATTCATTGTTTTCTGGGTTGGTGATTGCACC
<P C A I S F I G K P N K V R Y T * * K * L P F I * Q K R P Q H N C W
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
7900
AATCATTCCATTCAAAATTGTTGTTTTACCACACCCATTCCGCCCGATAAAAGCATGAATGTTCGTGCTGGGCATAGAATTAACCGTCACCTCAAAAGGT
<D N W E F N N N N * W V W S A R Y F C S H P H Q A Y F * G D G * F T
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
8000
ATAGTTAAATCACTGAATCCGGGAGCACTTTTTCTATTAAATGAAAAGTGGAAATCTGACAATTCTGGCAAACCATTTAACACACGTGCGAACTGTCCAT
<Y N P * Q I R S C K K * * I P L P F R V I R A F W K V C T R V I W
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
8100
GAATTTCTGAAAGAGTTACCCCTCTAAGTAATGAGGTGTTAAGGACGCTTTCATTTTCAATGTCGGCTAATCGATTTGGCCATACTACTAAATCCTGAAT
<S N R F S N G R * T I L H * P R K * K * H R S I S K A M S S F G S Y
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]
8200
AGCTTTAAGAAGGTTATGTTTAAAACCATCGCTTAATTTGCTGAGATTAACATAGTAGTCAATGCTTTCACCTAAGGAAAAAAACATTTCAGGGAGTTGA
<S * S P * T * F W R K I Q Q S * C L L * E K * R L F P V N * P T S
EA59 (525); CODON_START=1; DB_XREF=PID:G215132; TRA
MRNA-PL (ALT.; VIA T'J4 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J3 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J2 TERMINATOR) [SPLIT]
MRNA-PL (ALT.; VIA T'J1 TERMINATOR) [SPLIT]

FIG. 2(C2)



(SEQ ID NO: 65)

FIG. 2(C2) cont.


9400
AGTCCAGAAACAACTTTGGCACATATCAATATTATGCTCTCGACAAATAACTTTTTTGCATTTTTTGCACGATGCATTTGCCTTTCGCCTTATTTAGAG
<T W F C S Q C M D I N H E R C I V K K C K K C S A N A K R R I K S
<ORF1 C-TERM
9500
GGGCAGTAAGTACAGTAAGTACGTTTTTTCATTACTGGCTCTTCAGTACTGTCATCTGATGTACCAGGCACTTCATTTGGCAAAATATTAGAGATATTAT
<P C Y T C Y T R K K M V P E E T S D D S T G P V E N P L I N S I N D
<ORF1 C-TERM
9600
CGCGCAAATATCTCTTCAAAGTAGGAGCTTCTAAACGGTTACGCATAAACGATGACGTCAGGCTCATGTAAAGGTTTCTCATAAATTTTTTGCGACTTTG
<R L Y R K L T P A E L R N R M F S S T L S M Y L N R M F K K R S Q
<ORF1 C-TERM
9700
AACCTTTTCTCCCTTGCTACTGACATTATGGCTGTATATAATAAAAGAATTTATGCAGGCAATGTTTATCATTCCGTACAATAATGCCATAGGCCACCTA
<V K E G K S S V N H S Y I I F S N I C A I N I M G Y L L A N P W R
<ORF1 C-TERM
9800
TTCGTCTTCCTACTGCAGGTCATCACAGAACAGATTTGGTCTAGCGTGTCCACTCCGCCTTTAGTTTGATTATAATACATAACCATTTGCGGTTTACCGG
<N T K R S C T M V S C M Q D L T D V G G K T Q N Y Y M V M Q P K G T
<ORF1 C-TERM
9900
TACTTTCGTTGATAGAAGCATCCTCATCACAAGATGATAATAAGTATACCATCTTAGCTGGCTTCGGTTTATATGAGACGAGAGTAAGGGGTCCGTCAAA
<S E N I S A D E D C S S L L Y V M K A P K P K Y S V L T L P G D F
<ORF1 C-TERM
ACAAAACATCGATGTTCCCACTGGCCTGGAGCGACTGTTTTTCAGTACTTCCGGTATCTCGCGTTTGTTTGATCGCACGGTACC (SEQ ID NO: 63)
<C F M S T G V P R S R S N K L V E P I E R K N S R V T G (SEQ ID NO: 66)
<ORF1 C-TERM

A.



ITR cartridge (702 bp)

B.

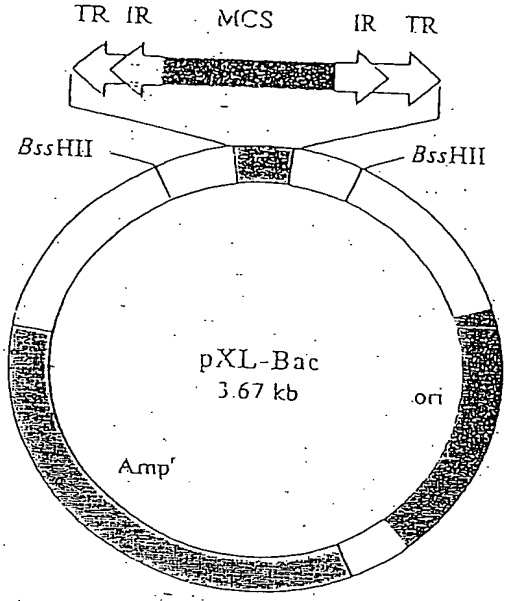


FIG. 3

ITR Cartridge Sequence Sequence Range: 1 to 707

```
                                                                    50
GGATCCCATGCGTCAATTTTACGCAGACTATCTTTCTAGGGTTAATCTAG
      ______RIGHT TERMINAL REPEAT________>
                                                                   100
CTGCATCAGGATCATATCGTCGGGTCTTTTTTCCGGCTCAGTCATCGCCC
                                                                   150
AAGCTGGCGCTATCTGGGCATCGGGGAGGAAGAAGCCCGTGCCTTTTCCC
                                                                   200
GCGAGGTTGAAGCGGCATGGAAAGAGTTTGCCGAGGATGACTGCTGCTGC
                                                                   250
ATTGACGTTGAGCGAAAACGCACGTTTACCATGATGATTCGGGAAGGTGT
                                                                   300
GGCCATGCACGCCTTTAACGGTGAACTGTTCGTTCAGGCCACCTGGGATA
                                                                   350
CCAGTTCGTCGCGGCTTTTCCGGACACAGTTCCGGATGGTCAGCCCGAAG
                                                                   400
CGCATCAGCAACCCGAACAATACCGGCGACAGCCGGAACTGCCGTGCCGG
                                                                   450
TGTGCAGATTAATGACAGCGGTGCGGCGCTGGGATATTACGTCAGCGAGG
                                                                   500
ACGGGTATCCTGGCTGGATGCCGCAGAAATGGACATGGATACCCCGTGAG
                                                                   550
TTACCCGGCGGGCGCGCCTCGTTCATTCACGTTTTTGAACCCGTGGAGGA
                                                                   600
CGGGCAGACTCGCGGTGCAAATGTGTTTTACAGCGTGATGGAGCAGATGA
                                                                   650
AGATGCTCGACACGCTGCAGAACACGCAGCTAGATTAACCCTAGAAAGAT
                                                          _________>
                                                                   700
AATCATATTGTGACGTACGTTAAAGATAATCATGCGTAAAATTGACGCAT
_________________LEFT TERMINAL REPEAT_________________>

GGGATCC  (SEQ ID NO: 40)
_>
```

FIG. 3(C1)

FIG. 3 (C2)

pXL-Bac

Sequence Range: 1 to 3662

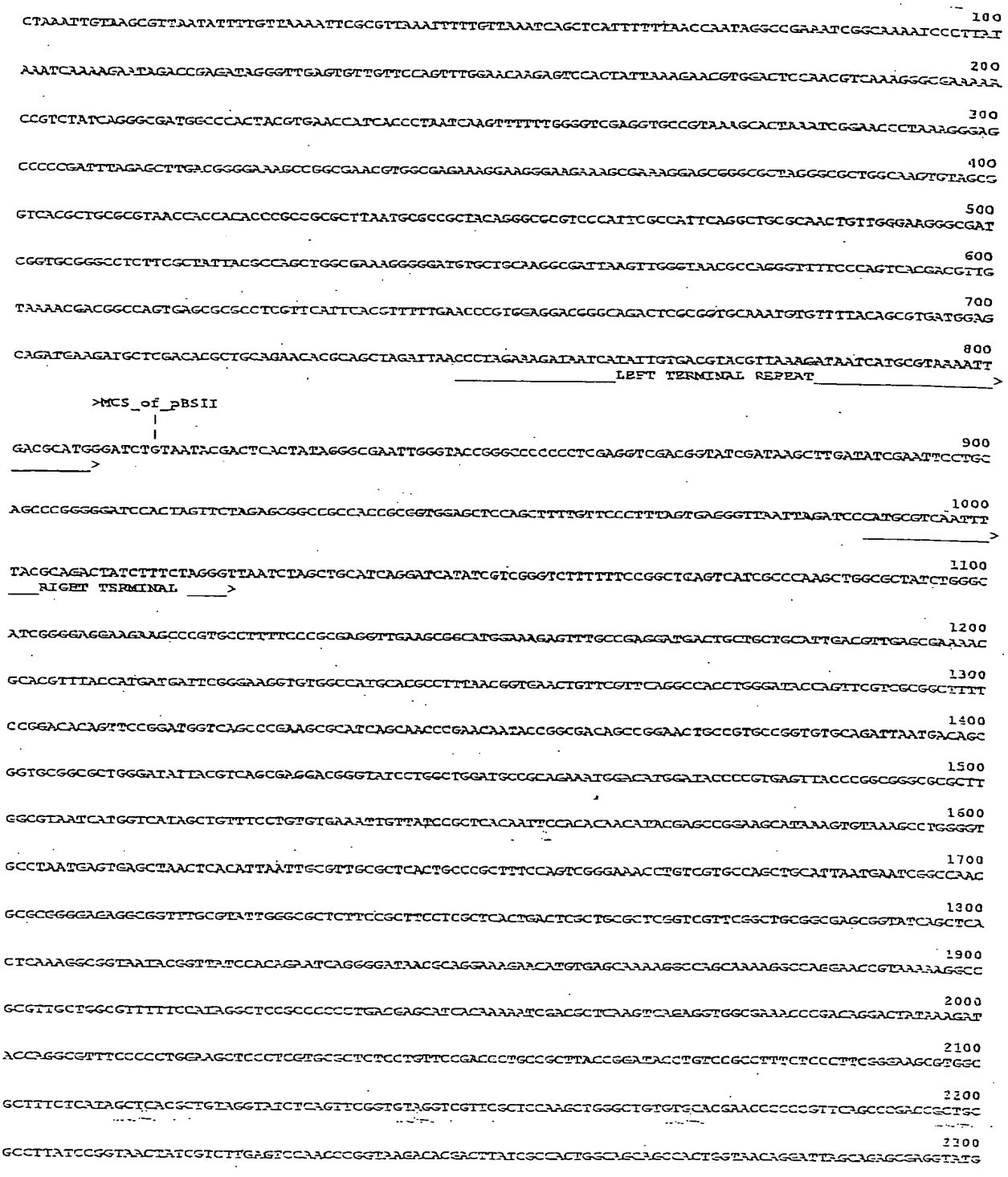


FIG 3 (C2) Cont.

2400
TAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGG

2500
AAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCT

2600
CAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCA

<Col81_origin

2700
CCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACC
<___AMPCILLIN RESISTAN____

2800
TATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCT
<_____AMPCILLIN RESISTANCE_____

2900
GCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTAT
<_____AMPCILLIN RESISTANCE_____

3000
CCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGT
<_____AMPCILLIN RESISTANCE_____

3100
GGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGC
<_____AMPCILLIN RESISTANCE_____

3200
TCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCG
<_____AMPCILLIN RESISTANCE_____

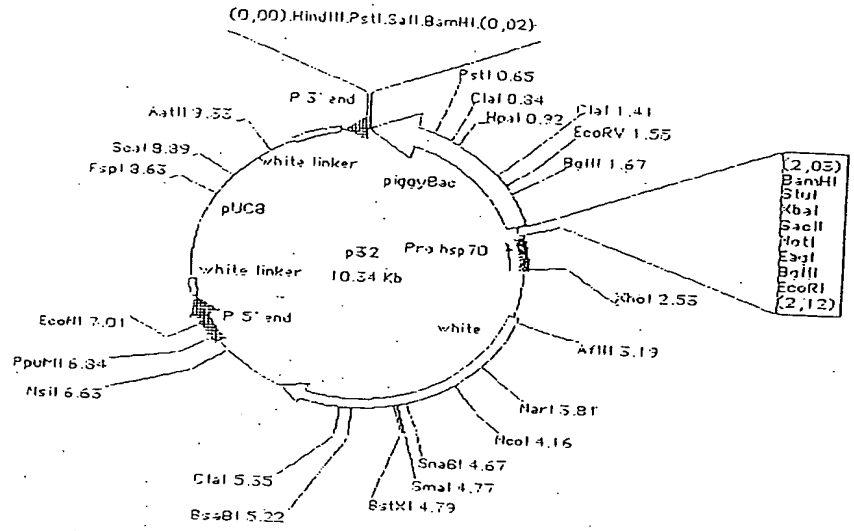
3300
TAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAA
<_____AMPCILLIN RESISTANCE_____

3400
TACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCG
<_____AMPCILLIN RESISTANCE_____

3500
ATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGG
<_____AMPCILLIN RESISTANCE_____

3600
GAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATT
<_____AMPCILLIN RESISTANCE_____

TGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 41)



Plasmid name : p32
Plasmid size : 10.34 kb

FIG. 4

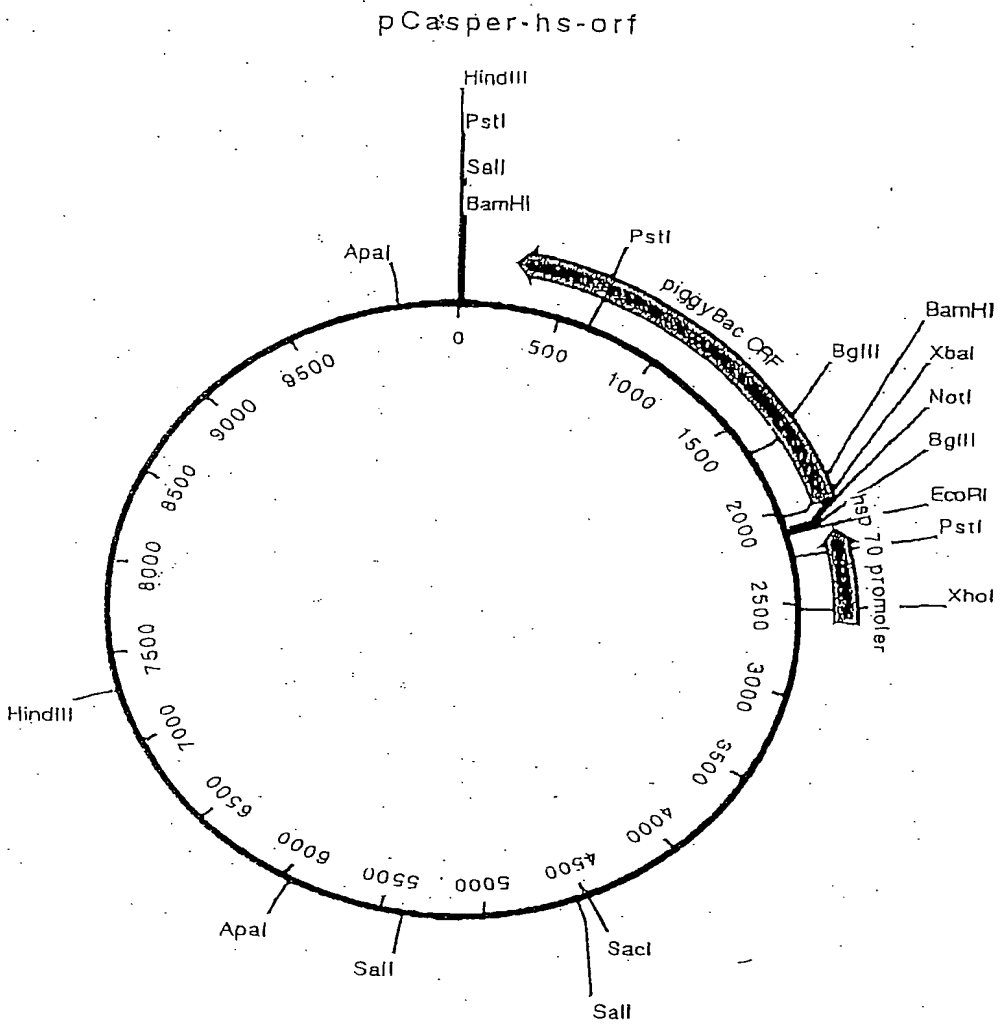

pCasper-hs-orf
HindIII
PstI
SalI
BamHI
ApaI
PstI
piggyBac ORF
BamHI
BglII
XbaI
NotI
BglII
EcoRI
PstI
hsp 70 promoter
XhoI
HindIII
ApaI
SalI
SacI
SalI
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500

FIG. 5(A)

FIG 2-2

pBSII-hs-orf
Sequence Range: 1 to 5533

100

CTAAATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGC
TCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT

200

AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAG
TCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAA

300

CCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGG
GGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAG

400

CCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGG
AAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG

500

GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGC
GTCCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGAT

600

CGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGG
CGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACGTTG

700

TAAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTATAGGGCGAATTGGGTA
CCGGGCCCCCCCCTCGAGGTCGACGGTATCGATAAGCTATCCAGT

FIG. 5(B)

800

GCAGTAAAAAATAAAAAAAAAAATATGTTTTTTTAAATCTACATTCTCCAAAAAAGGG
TTTTATTAACTTACATACATACTAGAATTGATCCCCGATCCCC

900

CTAGAATCCCAAAACAAACTGGTTATTGTGGTAGGTCATTTGTTTGGCAGAAGAAAA
CTCGAGAAATTTCTCTGGCCGTTATTCGTTATTCTCTCTTTTC

1000

TTTTTGGGTCTCCCTCTCTGCACTAATGCTCTCTCACTCTGTCACACAGTAAACGGCA
TACTGCTCTCGTTGGTTCGAGAGAGCGCGCCTCGAATGTTCG

1100

CGAAAAGAGCGCCGGAGTATAAATAGAGCGCTTCGTCTACGGAGCGACAATTCAAT
TCAAACAAGCAAAGTGAACACGTCGCTAAGCGAAAGCTAAGCAA

1200

ATAAACAAGCGCAGCTGAACAAGCTAAACAATCTGCAGTAAAGTGCAAGTTAAAGT
GAATCAATTAAAAGTAACCAGCAACCAAGTAAATCAACTGCAAC

<hsp70_promoter

1300

TACTGAAATCTGCCAAGAAGTAATTATTGAATACAAGAAGAGAACTCTGAATAGGG
AATTGGGAATTCCTGCAGCCCGGGGGATCCTATATAATAAAATG

1400

GGTAGTTCTTTAGACGATGAGCATATCCTCTCTGCTCTTCTGCAAAGCGATGACGAG
CTTGTTGGTGAGGATTCTGACAGTGAAATATCAGATCACGTAA

1500

FIG. 5(B)

GTGAAGATGACGTCCAGAGCGATACAGAAGAAGCGTTTATAGATGAGGTACATGAA
GTGCAGCCAACGTCAAGCGGTAGTGAAATATTAGACGAACAAAA

1600

TGTTATTGAACAACCAGGTTCTTCATTGGCTTCTAACAGAATCTTGACCTTGCCACAG
AGGACTATTAGAGGTAAGAATAAACATTGTTGGTCAACTTCA

1700

AAGTCCACGAGGCGTAGCCGAGTCTCTGCACTGAACATTGTCAGATCTCAAAGAGG
TCCGACGCGTATGTGCCGCAATATATATGACCCACTTTTATGCT

1800

TCAAACTATTTTTTACTGATGAGATAATTTCGGAAATTGTAAAATGGACAAATGCTG
AGATATCATTGAAACGTCGGGAATCTATGACAGGTGCTACATT

1900

TCGTGACACGAATGAAGATGAAATCTATGCTTTCTTTGGTATTCTGGTAATGACAGC
AGTGAGAAAAGATAACCACATGTCCACAGATGACCTCTTTGAT

2000

CGATCTTTGTCAATGGTGTACGTCTCTGTAATGAGTCGTGATCGTTTTGATTTTTTGA
TACGATGTCTTAGAATGGATGACAAAAGTATACGGCCCACAC

2100

TTCGAGAAAACGATGTATTTACTCCTGTTAGAAAAATATGGGATCTCTTTATCCATC
AGTGCATACAAAATTACACTCCAGGGGCTCATTTGACCATAGA

2200

TGAACAGTTACTTGGTTTTAGAGGACGGTGTCCGTTTAGGATGTATATCCCAAACAA
GCCAAGTAAGTATGGAATAAAAATCCTCATGATGTGTGACAGT

FIG. 5(B)

2300

GGTACGAAGTATATGATAAATGGAATGCCTTATTTGGGAAGAGGAACACAGACCAA
CGGAGTACCACTCGGTGAATACTACGTGAAGGAGTTATCAAAGC

2400

CTGTGCACGGTAGTTGTCGTAATATTACGTGTGACAATTGGTTCACCTCAATCCCTTT
GGCAAAAAACTTACTACAAGAACCGTATAAGTTAACCATTGT

2500

GGGAACCGTGCGATCAAACAAACGCGAGATACCGGAAGTACTGAAAAACAGTCGCT
CCAGGCCAGTGGGAACATCGATGTTTTGTTTTGACGGACCCCTT

2600

ACTCTCGTCTCATATAAACCGAAGCCAGCTAAGATGGTATACTTATTATCATCTTGT
GATGAGGATGCTTCTATCAACGAAAGTACCGGTAAACCGCAAA

2700

TGGTTATGTATTATAATCAAACTAAAGGCGGAGTGGACACGCTAGACCAAATGTGTT
CTGTGATGACCTGCAGTAGGAAGACGAATAGGTGGCCTATGGC

2800

ATTATTGTACGGAATGATAAACATTGCCTGCATAAATTCTTTTATTATATACAGCCAT
AATGTCAGTAGCAAGGGAGAAAAGGTTCAAAGTCGCAAAAAA

2900

TTTATGAGAAACCTTTACATGAGCCTGACGTCATCGTTTATGCGTAAGCGTTTAGAA
GCTCCTACTTTGAAGAGATATTTGCGCGATAATATCTCTAATA

3000

TTTTGCCAAATGAAGTGCCTGGTACATCAGATGACAGTACTGAAGAGCCAGTAATGA

FIG. 5(B)

AAAAACGTACTTACTGTACTTACTGCCCCTCTAAAATAAGGCG

3100

AAAGGCAAATGCATCGTGCAAAAAATGCAAAAAAGTTATTTGTCGAGAGCATAATA
TTGATATGTGCCAAAGTTGTTTCTGACTGACTAATAAGTATAAT

3200

TTGTTTCTATTATGTATAAGTTAAGCTAATTACTTATTTTATAATACAACATGACTGT
TTTTAAAGTACAAAATAAGTTTATTTTTGTAAAAGAGAGAAT

3300

GTTTAAAAGTTTTGTTACTTTAGAAGAAATTTTGAGTTTTTGTTTTTTTTTAATAAATA
AATAAACATAAATAAATTGTTTGTTGAATTTGGATCCACTA

3400

GTTCTAGAGCGGCCGCCACCGCGGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGG
TTAATTGCGCGCTTGGCGTAATCATGGTCATAGCTGTTTCCTG

3500

TGTGAAATTGTTATCCGCTCACAATTCCACACAACATACGAGCCGGAAGCATAAAGT
GTAAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAAT

3600

TGCGTTGCGCTCACTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTA
ATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGG

3700

CGCTCTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAG
CGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAG

3800

FIG. 5(B)

AATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAG
GAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCG

3900

CCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGA
CAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTC

4000

GTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTT
CGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATC

4100

TCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTC
AGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTC

4200

CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTA
GCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGG

4300

TGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAG
CCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCA

4400

AACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCA
GAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGG

4500

GTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATC
AAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGT

FIG. 5(B)

<ColE1_origin

4600

TTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTA
ATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCAT
_____AMPCILLIN
RESISTANCE_____>

4700

CCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCAT
CTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACC
_____AMPCILLIN
RESISTANCE_____>

4800

GGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTG
GTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGC
_____AMPCILLIN
RESISTANCE_____>

4900

CGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATT
GCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTT
_____AMPCILLIN
RESISTANCE_____>

5000

CATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCA
AAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAG
_____AMPCILLIN
RESISTANCE_____>

5100

FIG. 5(B)

TAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACT
GTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTAC
_____AMPCILLIN
RESISTANCE_____>

5200

TCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCG
TCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAG
_____AMPCILLIN
RESISTANCE_____>

5300

TGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGT
TGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATC
_____AMPCILLIN
RESISTANCE_____>

5400

TTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA
TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATA
_____AMPCILLIN
RESISTANCE_____>

5500

CTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGA
GCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAG
_____>

GGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ IDNO: 42)

FIG. 5(B)

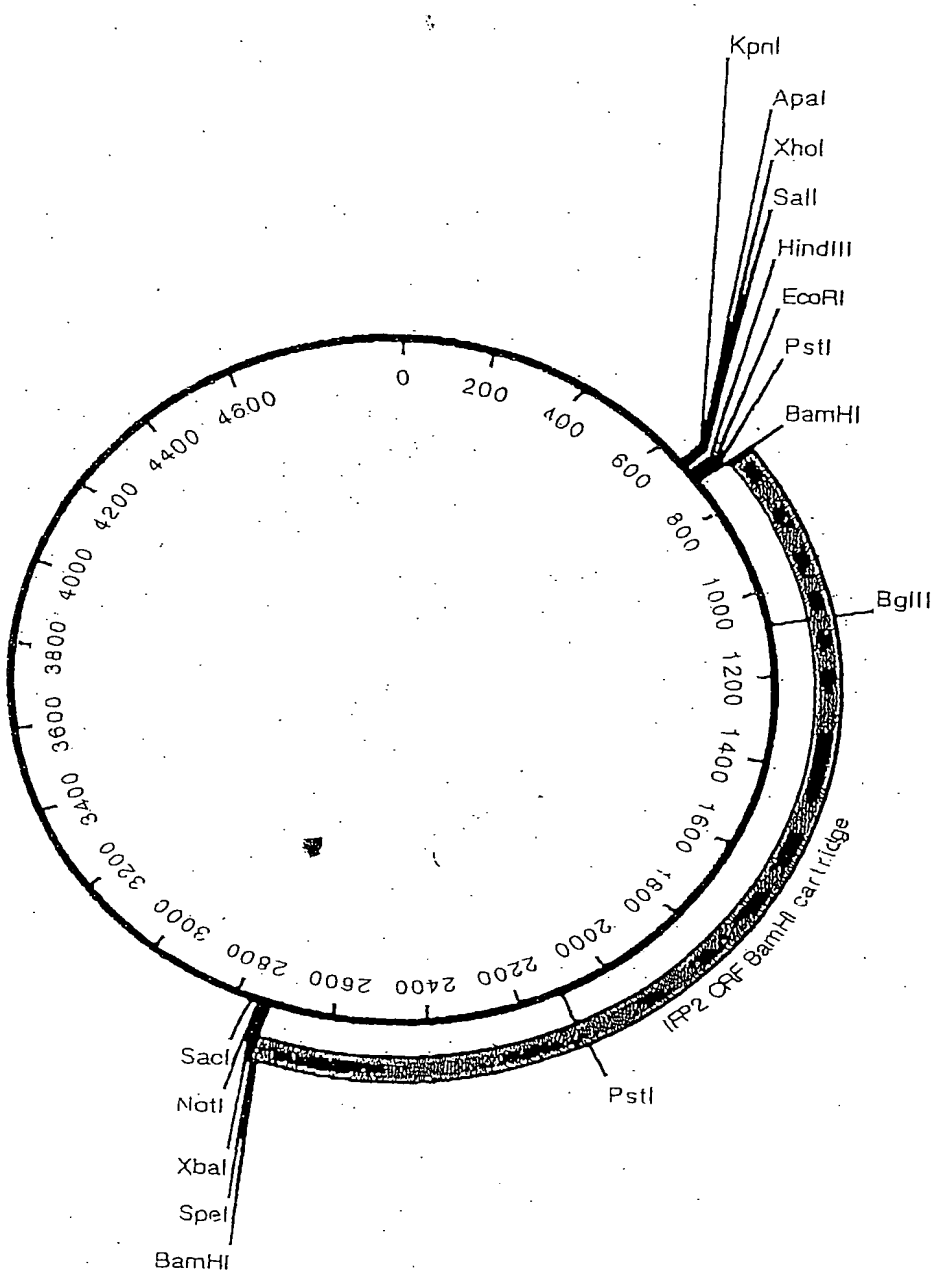

pBSII-IFP2orf
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
BglII
IFP2 ORF BamHI cartridge
PstI
SacI
NotI
XbaI
SpeI
BamHI
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600

FIG. 6(A)

Sequence Range: 1 to 4971

100

CTAAATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGC
TCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT

200

AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAG
TCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAA

300

CCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGG
GGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAG

400

CCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGG
AAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG

500

GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGC
GTCCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGAT

600

CGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGG
CGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACGTTG

700

TAAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTATAGGGCGAATTGGGTA
CCGGGCCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTGATATC

FIG. 6(B)

800

GAATTCCTGCAGCCCGGGGGATCCTATATAATAAAATGGGTAGTTCTTTAGACGATG
AGCATATCCTCTCTGCTCTTCTGCAAAGCGATGACGAGCTTGT

900

TGGTGAGGATTCTGACAGTGAAATATCAGATCACGTAAGTGAAGATGACGTCCAGA
GCGATACAGAAGAAGCGTTTATAGATGAGGTACATGAAGTGCAG

1000

CCAACGTCAAGCGGTAGTGAAATATTAGACGAACAAAATGTTATTGAACAACCAGG
TTCTTCATTGGCTTCTAACAGAATCTTGACCTTGCCACAGAGGA

1100

CTATTAGAGGTAAGAATAAACATTGTTGGTCAACTTCAAAGTCCACGAGGCGTAGCC
GAGTCTCTGCACTGAACATTGTCAGATCTCAAAGAGGTCCGAC

1200

GCGTATGTGCCGCAATATATATGACCCACTTTTATGCTTCAAACTATTTTTTACTGAT
GAGATAATTTCGGAAATTGTAAAATGGACAAATGCTGAGATA

1300

TCATTGAAACGTCGGGAATCTATGACAGGTGCTACATTTCGTGACACGAATGAAGAT
GAAATCTATGCTTTCTTTGGTATTCTGGTAATGACAGCAGTGA

1400

GAAAAGATAACCACATGTCCACAGATGACCTCTTTGATCGATCTTTGTCAATGGTGT
ACGTCTCTGTAATGAGTCGTGATCGTTTTGATTTTTTGATACG

1500

ATGTCTTAGAATGGATGACAAAAGTATACGGCCCACACTTCGAGAAAACGATGTATT

FIG. 6(B)

TACTCCTGTTAGAAAAATATGGGATCTCTTTATCCATCAGTGC

1600

ATACAAAATTACACTCCAGGGGCTCATTTGACCATAGATGAACAGTTACTTGGTTTT
AGAGGACGGTGTCCGTTTAGGATGTATATCCCAAACAAGCCAA

1700

GTAAGTATGGAATAAAAATCCTCATGATGTGTGACAGTGGTACGAAGTATATGATA
AATGGAATGCCTTATTTGGGAAGAGGAACACAGACCAACGGAGT

1800

ACCACTCGGTGAATACTACGTGAAGGAGTTATCAAAGCCTGTGCACGGTAGTTGTCG
TAATATTACGTGTGACAATTGGTTCACCTCAATCCCTTTGGCA

1900

AAAAACTTACTACAAGAACCGTATAAGTTAACCATTGTGGGAACCGTGCGATCAAA
CAAACGCGAGATACCGGAAGTACTGAAAAACAGTCGCTCCAGGC

2000

CAGTGGGAACATCGATGTTTTGTTTTGACGGACCCCTTACTCTCGTCTCATATAAACC
GAAGCCAGCTAAGATGGTATACTTATTATCATCTTGTGATGA

2100

GGATGCTTCTATCAACGAAAGTACCGGTAAACCGCAAATGGTTATGTATTATAATCA
AACTAAAGGCGGAGTGGACACGCTAGACCAAATGTGTTCTGTG

2200

ATGACCTGCAGTAGGAAGACGAATAGGTGGCCTATGGCATTATTGTACGGAATGAT
AAACATTGCCTGCATAAATTCTTTTATTATATACAGCCATAATG

2300

FIG. 6(B)

TCAGTAGCAAGGGAGAAAAGGTTCAAAGTCGCAAAAAATTTATGAGAAACCTTTAC
ATGAGCCTGACGTCATCGTTTATGCGTAAGCGTTTAGAAGCTCC

2400

TACTTTGAAGAGATATTTGCGCGATAATATCTCTAATATTTTGCCAAATGAAGTGCCT
GGTACATCAGATGACAGTACTGAAGAGCCAGTAATGAAAAAA

2500

CGTACTTACTGTACTTACTGCCCCTCTAAAATAAGGCGAAAGGCAAATGCATCGTGC
AAAAAATGCAAAAAAGTTATTTGTCGAGAGCATAATATTGATA

2600

TGTGCCAAAGTTGTTTCTGACTGACTAATAAGTATAATTTGTTTCTATTATGTATAAG
TTAAGCTAATTACTTATTTTATAATACAACATGACTGTTTTT

2700

AAAGTACAAAATAAGTTTATTTTTGTAAAAGAGAGAATGTTTAAAAGTTTTGTTACT
TTAGAAGAAATTTTGAGTTTTTGTTTTTTTTTAATAAATAAAT

2800

AAACATAAATAAATTGTTTGTTGAATTTGGATCCACTAGTTCTAGAGCGGCCGCCAC
CGCGGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGGTTAAT

2900

TGCGCGCTTGGCGTAATCATGGTCATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTC
ACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAA

3000

GCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCC
GCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAA

FIG. 6(B)

>ColE1_origin

3100

TCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGC
TCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGT

3200

ATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAG
GAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGT

3300

AAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCAC
AAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGAC

3400

TATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGA
CCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGG

3500

AAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGT
TCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCC

3600

GACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGAC
TTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAG

3700

CGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACA
CTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGT

3800

FIG. 6(B)

TACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTA
GCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAA

3900

AAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAC
GAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAA

4000

GGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTA
TATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAG
_____>

4100

TGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCC
GTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGC
_____AMPCILLIN
RESISTANCE_____>

4200

CCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCA
ATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTG
_____AMPCILLIN
RESISTANCE_____>

4300

CAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTA
GTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTAC
_____AMPCILLIN
RESISTANCE_____>

4400

FIG. 6(B)

AGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAA
CGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAA
_____AMPCILLIN
RESISTANCE_____>

4500

GCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTA
TCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCA
_____AMPCILLIN
RESISTANCE_____>

4600

TGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAG
AATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAAT
_____AMPCILLIN
RESISTANCE_____>

4700

ACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAAC
GTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGA
_____AMPCILLIN
RESISTANCE_____>

4800

TCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCA
CCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCG
_____AMPCILLIN
RESISTANCE_____>

4900

CAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTC
AATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGG

FIG. 6(B)

_____AMPCILLIN RESISTANCE_____>

ATACATATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCC
CCGAAAAGTGCCAC (SEQ IDNO: 43)

FIG. 6(B)

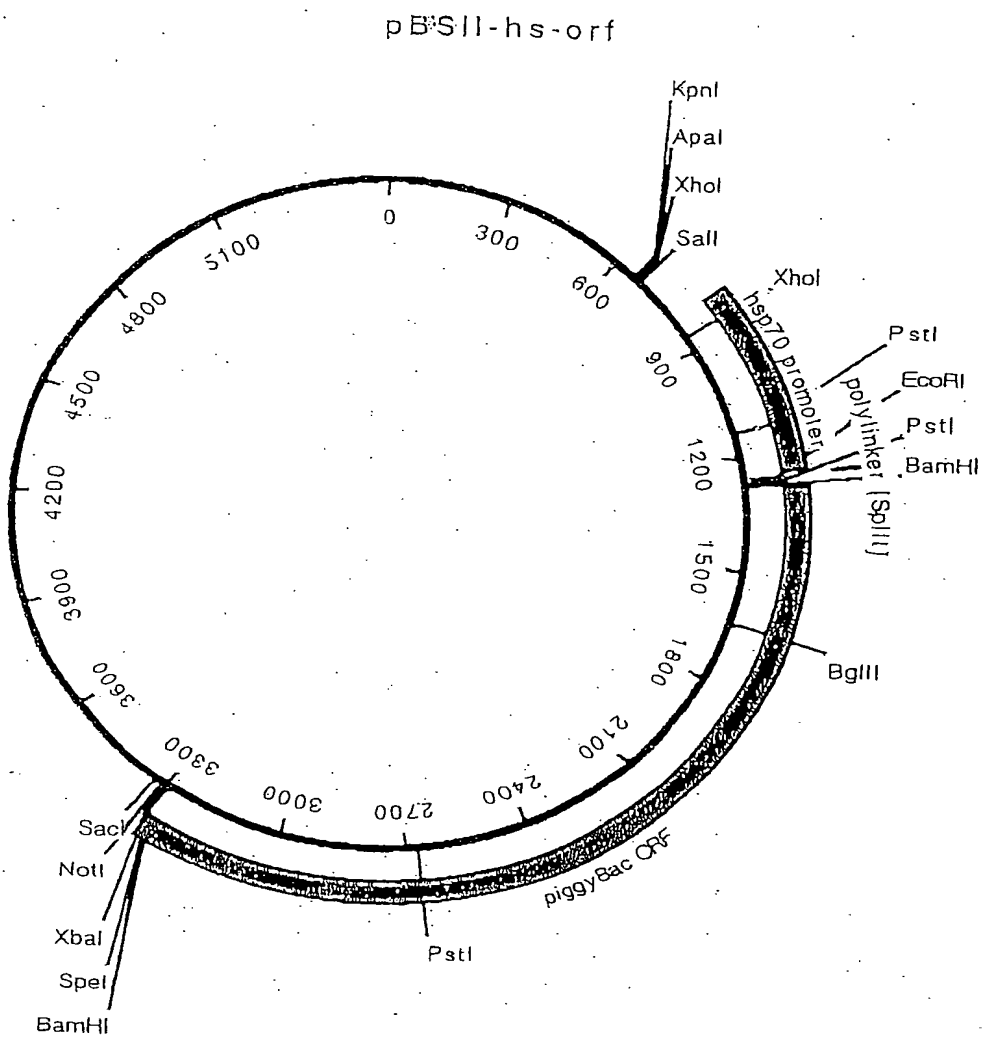

pBSII-hs-orf
KpnI
ApaI
XhoI
SalI
XhoI
hsp70 promoter
PstI
EcoRI
PstI
BamHI
polylinker (SpIII)
BglII
piggyBac ORF
PstI
SacI
NotI
XbaI
SpeI
BamHI
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100

FIG. 7(A)

pBSII-hs-orf

FIG. 7(B)

Sequence Range: 1 to 5533

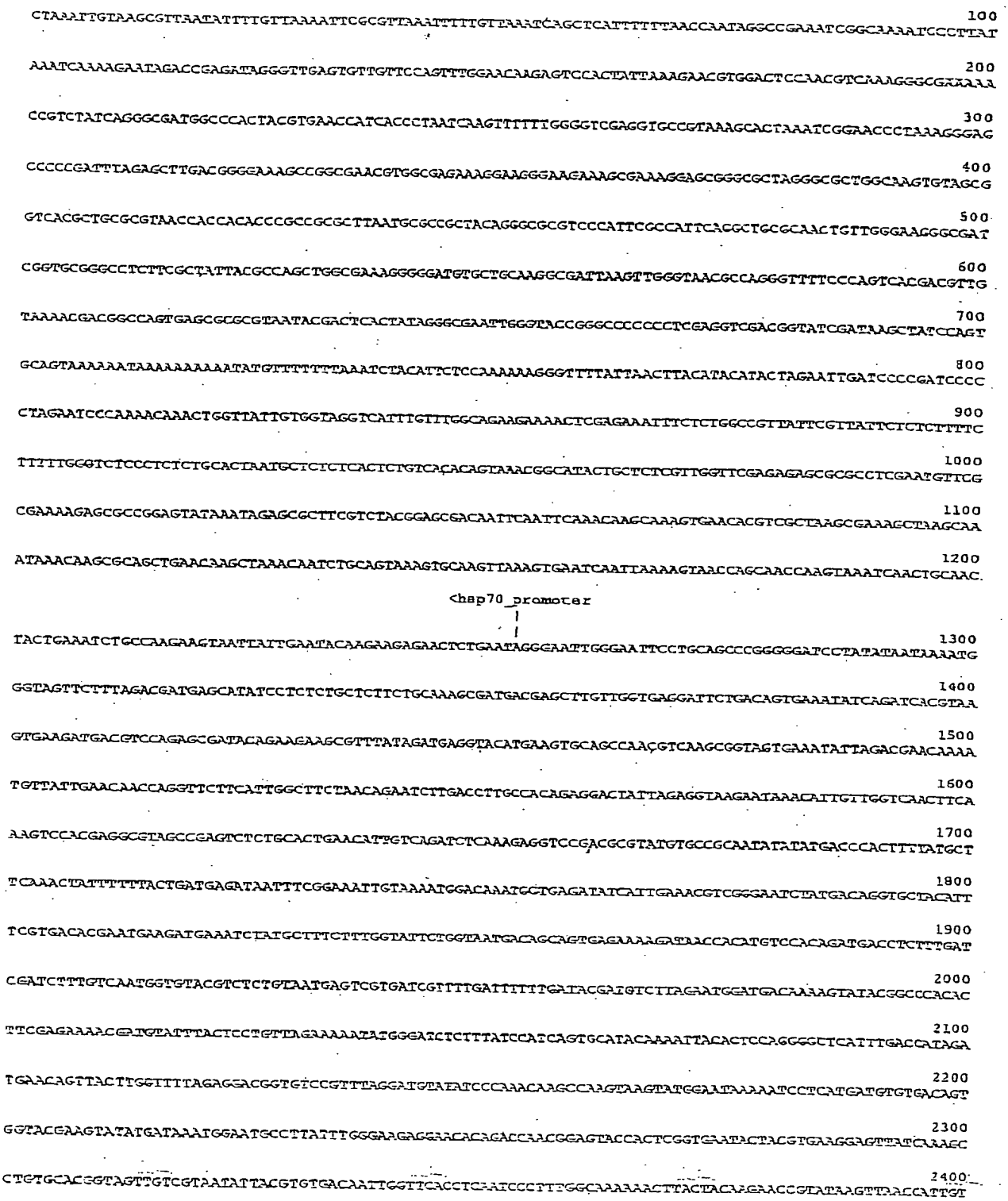


Fig 7(B) cont.

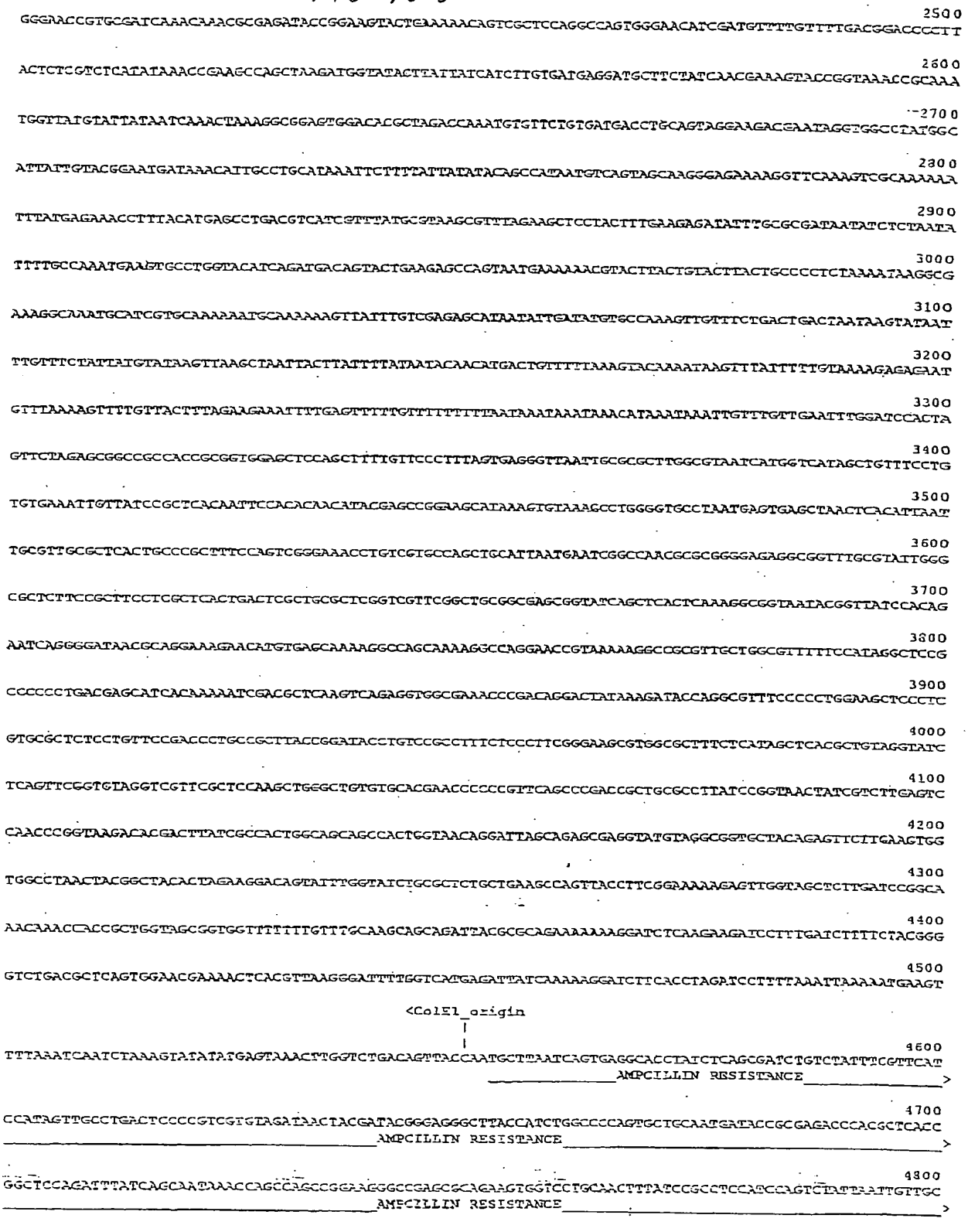

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2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
<ColE1_origin
4600
AMPCILLIN RESISTANCE>
4700
AMPCILLIN RESISTANCE>
4800
AMPCILLIN RESISTANCE>

FIG. 7(B) cont.

CGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTT 4900
AMPCILLIN RESISTANCE >

CATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAG 5000
AMPCILLIN RESISTANCE >

TAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTAC 5100
AMPCILLIN RESISTANCE >

TCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAG 5200
AMPCILLIN RESISTANCE >

TGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATC 5300
AMPCILLIN RESISTANCE >

TTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATA 5400
AMPCILLIN RESISTANCE >

CTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAG 5500
>

GGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 42)

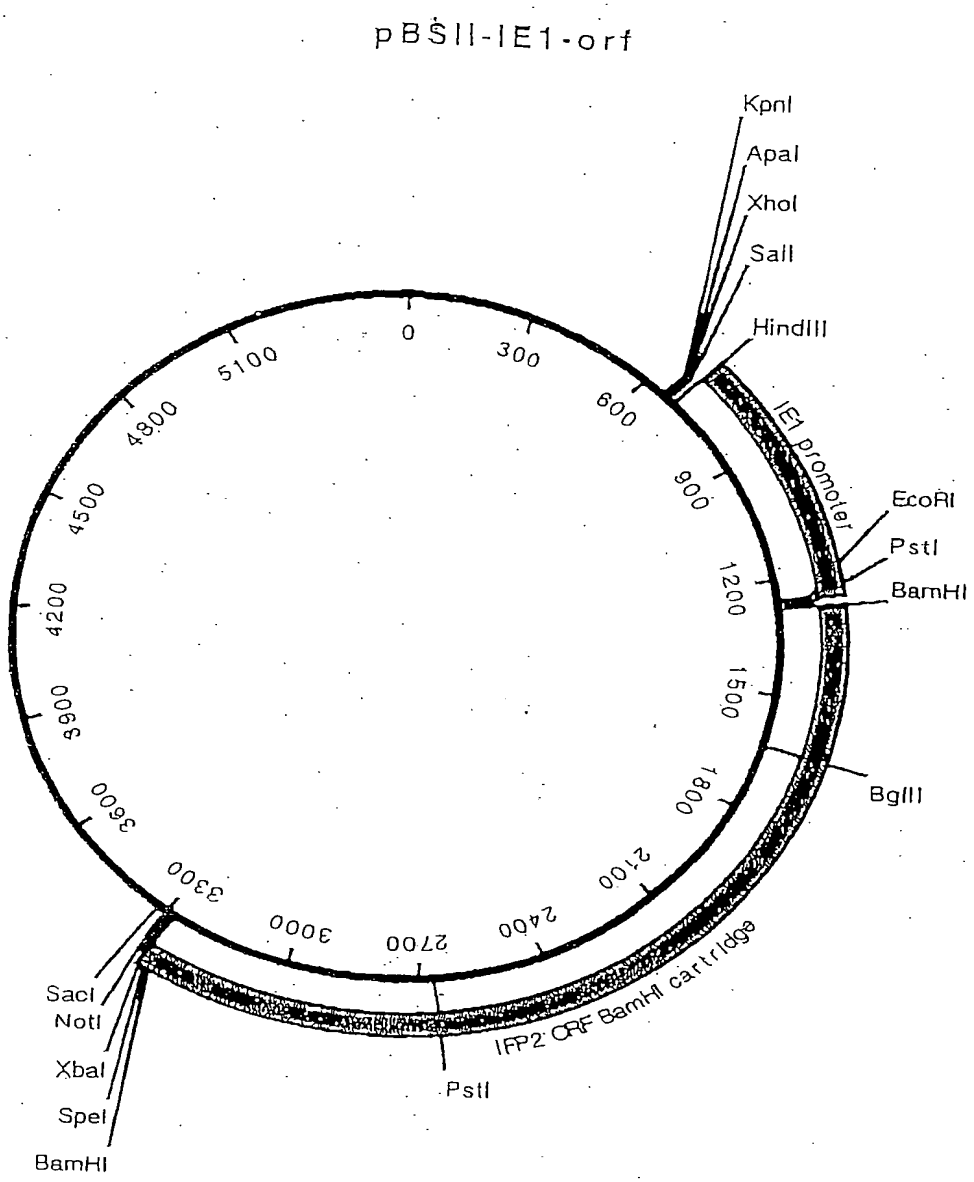

pBSII-IE1-orf
KpnI
ApaI
XhoI
SalI
HindIII
IE1 promoter
EcoRI
PstI
BamHI
BglII
IFP2 ORF BamHI cartridge
PstI
SacI
NotI
XbaI
SpeI
BamHI
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100

FIG. 8(A)

Sequence Range: 1 to 5523

100

CTAAATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGC
TCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT

200

AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAG
TCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAA

300

CCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGG
GGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAG

400

CCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGG
AAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG

500

GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGC
GTCCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGAT

600

CGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGG
CGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACGTTG

700

TAAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTATAGGGCGAATTGGGTA
CCGGGCCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTCGATGT

FIG. 8(B)

800

CTTTGTGATGCGCCGACATTTTTGTAGGTTATTGATAAAATGAACGGATACAGTTGC
CCGACATTATCATTAAATCCTTGGCGTAGAATTTGTCGGGTCC

900

ATTGTCCGTGTGCGCTAGCATGCCCGCTAACGGACCTCGTACTTTTGGCTTCAAAGG
TTTTGCGCACAGACAAAATGTGCCACACTTGCAGCTCTGCATG

1000

TGTGCGCGTTACCACAAATCCCAACGGCGCAGTGTACTTGTTGTATGCAAATAAATC
TCGATAAAGGCGCGGCGCGCGAATGCAGCTGATCACGTACGCT

1100

CCTCGTGTTCCGTTCAAGGACGGTGTTATCGACCTCAGATTAATGTTTATCGGCCGA
CTGTTTTCGTATCCGCTCACCAAACGCGTTTTTGCATTAACAT

1200

TGTATGTCGGCGGATGTTCTATATCTAATTTGAATAAATAAACGATAACCGCGTTGG
TTTTAGAGGGCATAATAAAAGAAATATTGTTATCGTGTTCGCC

1300

ATTAGGGCAGTATAAATTGACGTTCATGTTGGATATTGTTTCAGTTGCAAGTGAATT
CCTGCAGCCCGGGGGATCCTATATAATAAAATGGGTAGTTCTT

1400

TAGACGATGAGCATATCCTCTCTGCTCTTCTGCAAAGCGATGACGAGCTTGTTGGTG
AGGATTCTGACAGTGAAATATCAGATCACGTAAGTGAAGATGA

1500

CGTCCAGAGCGATACAGAAGAAGCGTTTATAGATGAGGTACATGAAGTGCAGCCAA

FIG. 8(B)

CGTCAAGCGGTAGTGAAATATTAGACGAACAAAATGTTATTGAA

1600

CAACCAGGTTCTTCATTGGCTTCTAACAGAATCTTGACCTTGCCACAGAGGACTATT
AGAGGTAAGAATAAACATTGTTGGTCAACTTCAAAGTCCACGA

1700

GGCGTAGCCGAGTCTCTGCACTGAACATTGTCAGATCTCAAAGAGGTCCGACGCGTA
TGTGCCGCAATATATATGACCCACTTTTATGCTTCAAACTATT

1800

TTTTACTGATGAGATAATTTCGGAAATTGTAAAATGGACAAATGCTGAGATATCATT
GAAACGTCGGGAATCTATGACAGGTGCTACATTTCGTGACACG

1900

AATGAAGATGAAATCTATGCTTTCTTTGGTATTCTGGTAATGACAGCAGTGAGAAAA
GATAACCACATGTCCACAGATGACCTCTTTGATCGATCTTTGT

2000

CAATGGTGTACGTCTCTGTAATGAGTCGTGATCGTTTTGATTTTTTGATACGATGTCT
TAGAATGGATGACAAAAGTATACGGCCCACACTTCGAGAAAA

2100

CGATGTATTTACTCCTGTTAGAAAAATATGGGATCTCTTTATCCATCAGTGCATACA
AAATTACACTCCAGGGGCTCATTTGACCATAGATGAACAGTTA

2200

CTTGGTTTTAGAGGACGGTGTCCGTTTAGGATGTATATCCCAAACAAGCCAAGTAAG
TATGGAATAAAAATCCTCATGATGTGTGACAGTGGTACGAAGT

2300

FIG. 8(B)

ATATGATAAATGGAATGCCTTATTTGGGAAGAGGAACACAGACCAACGGAGTACCA
CTCGGTGAATACTACGTGAAGGAGTTATCAAAGCCTGTGCACGG

2400

TAGTTGTCGTAATATTACGTGTGACAATTGGTTCACCTCAATCCCTTTGGCAAAAAA
CTTACTACAAGAACCGTATAAGTTAACCATTGTGGGAACCGTG

2500

CGATCAAACAAACGCGAGATACCGGAAGTACTGAAAAACAGTCGCTCCAGGCCAGT
GGGAACATCGATGTTTTGTTTTGACGGACCCCTTACTCTCGTCT

2600

CATATAAACCGAAGCCAGCTAAGATGGTATACTTATTATCATCTTGTGATGAGGATG
CTTCTATCAACGAAAGTACCGGTAAACCGCAAATGGTTATGTA

2700

TTATAATCAAACTAAAGGCGGAGTGGACACGCTAGACCAAATGTGTTCTGTGATGAC
CTGCAGTAGGAAGACGAATAGGTGGCCTATGGCATTATTGTAC

2800

GGAATGATAAACATTGCCTGCATAAATTCTTTTATTATATACAGCCATAATGTCAGT
AGCAAGGGAGAAAAGGTTCAAAGTCGCAAAAAATTTATGAGAA

2900

ACCTTTACATGAGCCTGACGTCATCGTTTATGCGTAAGCGTTTAGAAGCTCCTACTTT
GAAGAGATATTTGCGCGATAATATCTCTAATATTTTGCCAAA

3000

TGAAGTGCCTGGTACATCAGATGACAGTACTGAAGAGCCAGTAATGAAAAAACGTA
CTTACTGTACTTACTGCCCCTCTAAAATAAGGCGAAAGGCAAAT

FIG. 8(B)

3100

GCATCGTGCAAAAAATGCAAAAAAGTTATTTGTCGAGAGCATAATATTGATATGTGC
CAAAGTTGTTTCTGACTGACTAATAAGTATAATTTGTTTCTAT

3200

TATGTATAAGTTAAGCTAATTACTTATTTTATAATACAACATGACTGTTTTTAAAGTA
CAAAATAAGTTTATTTTTGTAAAAGAGAGAATGTTTAAAAGT

3300

TTTGTTACTTTAGAAGAAATTTTGAGTTTTTGTTTTTTTTTAATAAATAAATAAACAT
AAATAAATTGTTTGTTGAATTTGGATCCACTAGTTCTAGAGC

3400

GGCCGCCACCGCGGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGGTTAATTGCGC
GCTTGGCGTAATCATGGTCATAGCTGTTTCCTGTGTGAAATTG

3500

TTATCCGCTCACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCT
GGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGC

>ColE1_origin
|
3600

TCACTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGC
CAACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCG

3700

CTTCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAG
CTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGA

3800

FIG. 8(B)

TAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAA
AAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGAC

3900

GAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA
AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTC

4000

CTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGT
GGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGT

4100

GTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCG
CTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTA

4200

AGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAG
GTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACT

4300

ACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCT
TCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCAC

4400

CGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGG
ATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCT

4500

CAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGAT
CTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAA

FIG. 8(B)

4600

TCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGG
CACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGC
_____AMPCILLIN
RESISTANCE_____>

4700

CTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAG
TGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGAT
_____AMPCILLIN
RESISTANCE_____>

4800

TTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAAC
TTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTA
_____AMPCILLIN
RESISTANCE_____>

4900

GAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCA
TCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTC
_____AMPCILLIN
RESISTANCE_____>

5000

CGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGT
TAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCC
_____AMPCILLIN
RESISTANCE_____>

5100

GCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCAT

FIG. 8(B)

CCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGT
_____AMPCILLIN
RESISTANCE_____>

5200

CATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGG
ATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCAT
_____AMPCILLIN
RESISTANCE_____>

5300

TGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAG
TTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCT
_____AMPCILLIN
RESISTANCE_____>

5400

TTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAA
AAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCT
_____AMPCILLIN
RESISTANCE_____>

5500

TCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACAT
ATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCG

CACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 44)

FIG. 8(B)

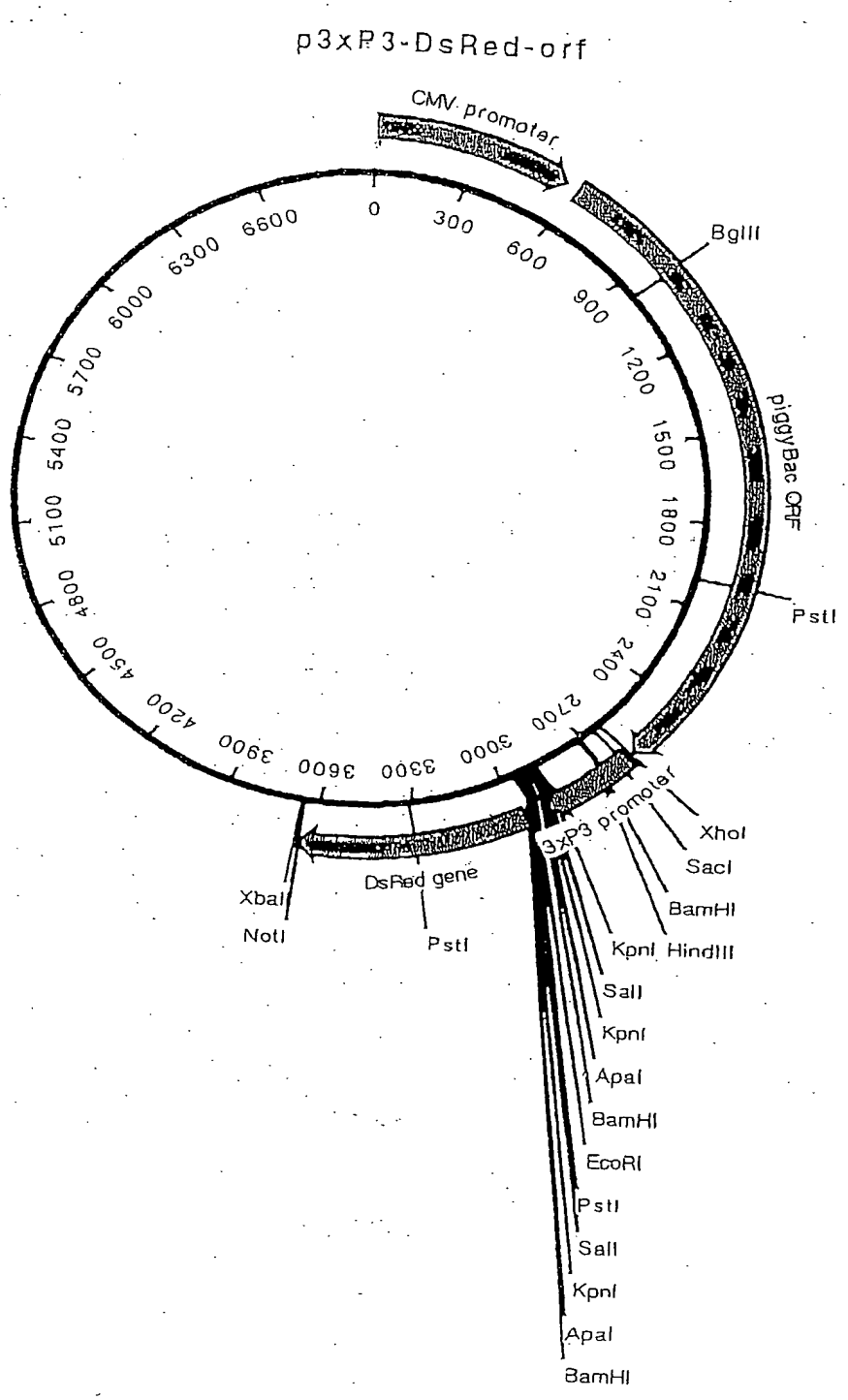

p3xP3-DsRed-orf
CMV promoter
BglII
piggyBac ORF
PstI
3xP3 promoter
XhoI
SacI
BamHI
KpnI
HindIII
SalI
KpnI
ApaI
BamHI
EcoRI
PstI
SalI
KpnI
ApaI
BamHI
DsRed gene
PstI
XbaI
NotI
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100
5400
5700
6000
6300
6600

FIG. 9(A)

p3XP3-DsRed-orf

Fig. 9(B)

Sequence Range: 1 to 6984

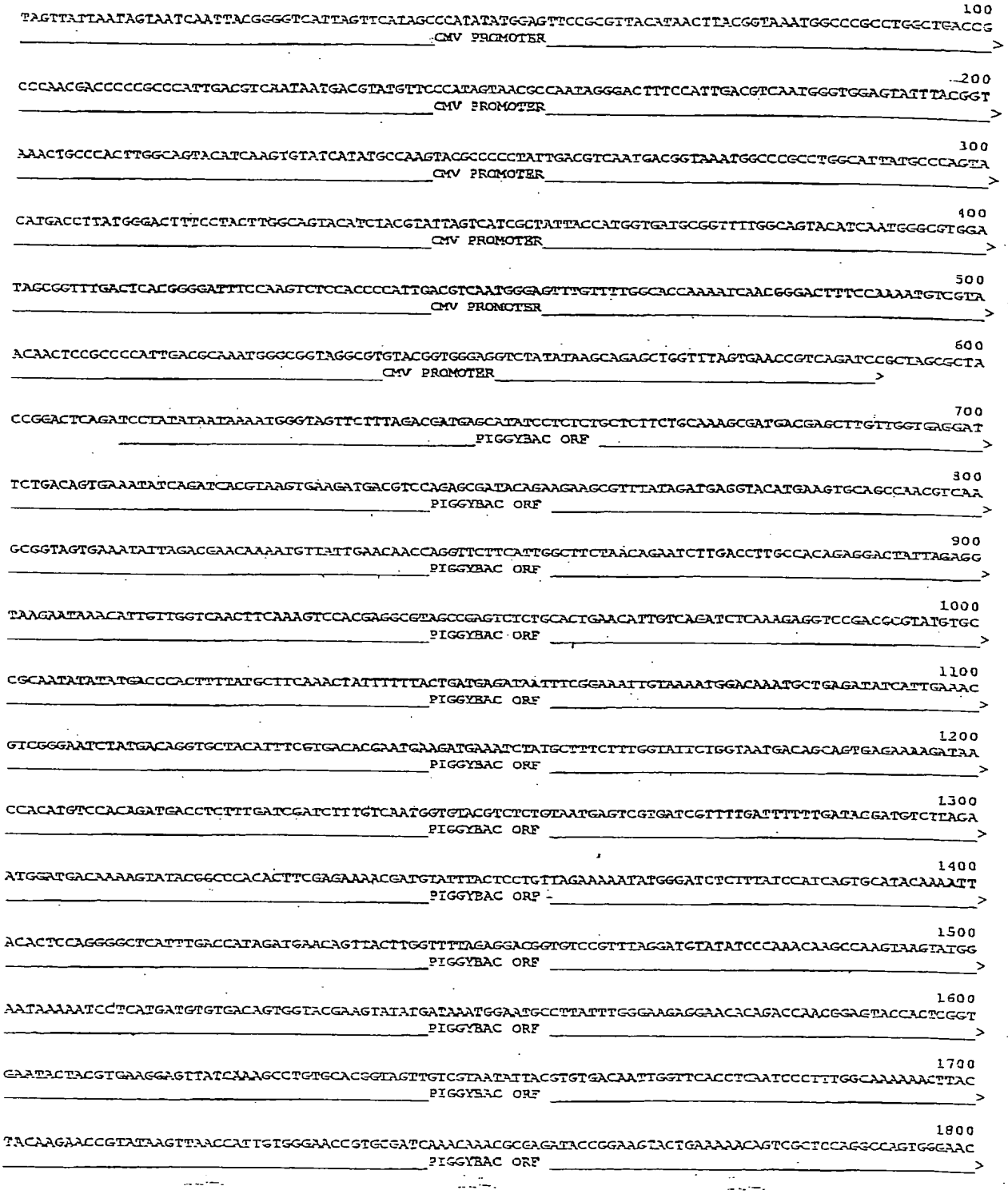


FIG. 9(B) cont.

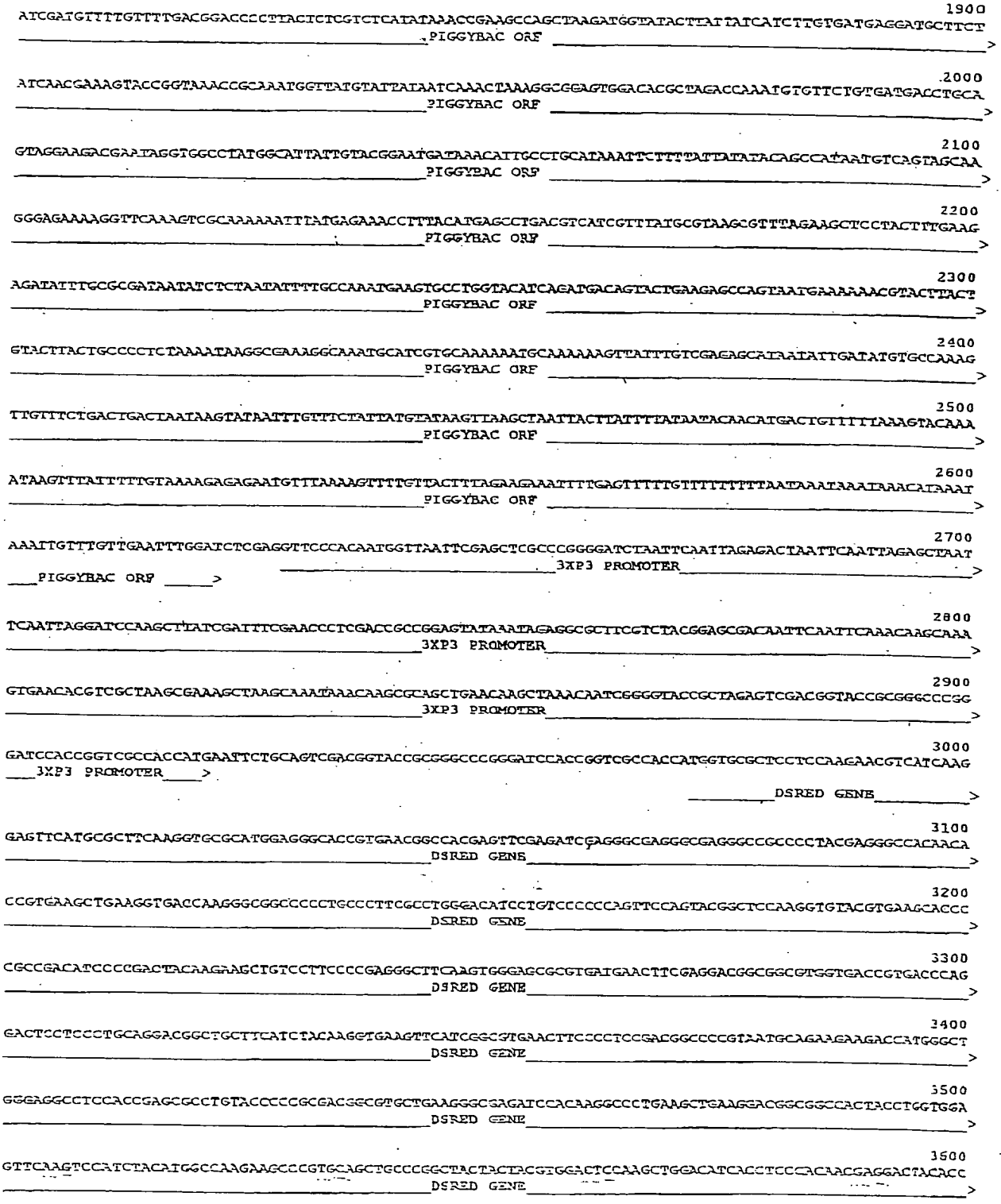

1900
ATCGATGTTTTGTTTTGACGGACCCCTTACTCTCGTCTCATATAAACCGAAGCCAGCTAAGATGGTATACTTATTATCATCTTGTGATGAGGATGCTTCT
PIGGYBAC ORF
2000
ATCAACGAAAGTACCGGTAAACCGCAAATGGTTATGTATTATAATCAAACTAAAGGCGGAGTGGACACGCTAGACCAAATGTGTTCTGTGATGACCTGCA
PIGGYBAC ORF
2100
GTAGGAAGACGAATAGGTGGCCTATGGCATTATTGTACGGAATGATAAACATTGCCTGCATAAATTCTTTTATTATATACAGCCATAATGTCAGTAGCAA
PIGGYBAC ORF
2200
GGGAGAAAAGGTTCAAAGTCGCAAAAAATTTATGAGAAACCTTTACATGAGCCTGACGTCATCGTTTATGCGTAAGCGTTTAGAAGCTCCTACTTTGAAG
PIGGYBAC ORF
2300
AGATATTTGCGCGATAATATCTCTAATATTTTGCCAAATGAAGTGCCTGGTACATCAGATGACAGTACTGAAGAGCCAGTAATGAAAAAACGTACTTACT
PIGGYBAC ORF
2400
GTACTTACTGCCCCTCTAAAATAAGGCGAAAGGCAAATGCATCGTGCAAAAAATGCAAAAAAGTTATTTGTCGAGAGCATAATATTGATATGTGCCAAAG
PIGGYBAC ORF
2500
TTGTTTCTGACTGACTAATAAGTATAATTTGTTTCTATTATGTATAAGTTAAGCTAATTACTTATTTATAATACAACATGACTGTTTTTAAAGTACAAA
PIGGYBAC ORF
2600
ATAAGTTTATTTTTGTAAAAGAGAGAATGTTTAAAAGTTTTGTTACTTTAGAAGAAATTTTGAGTTTTTGTTTTTTTTTAATAAATAAATAAACATAAAT
PIGGYBAC ORF
2700
AAATTGTTTGTTGAATTTGGATCTCGAGGTTCCCACAATGGTTAATTCGAGCTCGCCCGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAAT
3XP3 PROMOTER
PIGGYBAC ORF
2800
TCAATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGTATAAATAGAGGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAA
3XP3 PROMOTER
2900
GTGAACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGCTAAACAATCGGGGTACCGCTAGAGTCGACGGTACCGCGGGCCCGG
3XP3 PROMOTER
3000
GATCCACCGGTCGCCACCATGAATTCTGCAGTCGACGGTACCGCGGGCCCGGGATCCACCGGTCGCCACCATGGTGCGCTCCTCCAAGAACGTCATCAAG
3XP3 PROMOTER
DSRED GENE
3100
GAGTTCATGCGCTTCAAGGTGCGCATGGAGGGCACCGTGAACGGCCACGAGTTCGAGATCGAGGGCGAGGGCGAGGGCCGCCCCTACGAGGGCCACAACA
DSRED GENE
3200
CCGTGAAGCTGAAGGTGACCAAGGGCGGCCCCCTGCCCTTCGCCTGGGACATCCTGTCCCCCCAGTTCCAGTACGGCTCCAAGGTGTACGTGAAGCACCC
DSRED GENE
3300
CGCCGACATCCCCGACTACAAGAAGCTGTCCTTCCCCGAGGGCTTCAAGTGGGAGCGCGTGATGAACTTCGAGGACGGCGGCGTGGTGACCGTGACCCAG
DSRED GENE
3400
GACTCCTCCCTGCAGGACGGCTGCTTCATCTACAAGGTGAAGTTCATCGGCGTGAACTTCCCCTCCGACGGCCCCGTAATGCAGAAGAAGACCATGGGCT
DSRED GENE
3500
GGGAGGCCTCCACCGAGCGCCTGTACCCCCGCGACGGCGTGCTGAAGGGCGAGATCCACAAGGCCCTGAAGCTGAAGGACGGCGGCCACTACCTGGTGGA
DSRED GENE
3600
GTTCAAGTCCATCTACATGGCCAAGAAGCCCGTGCAGCTGCCCGGCTACTACTACGTGGACTCCAAGCTGGACATCACCTCCCACAACGAGGACTACACC
DSRED GENE

FIG. 9(B) cont.

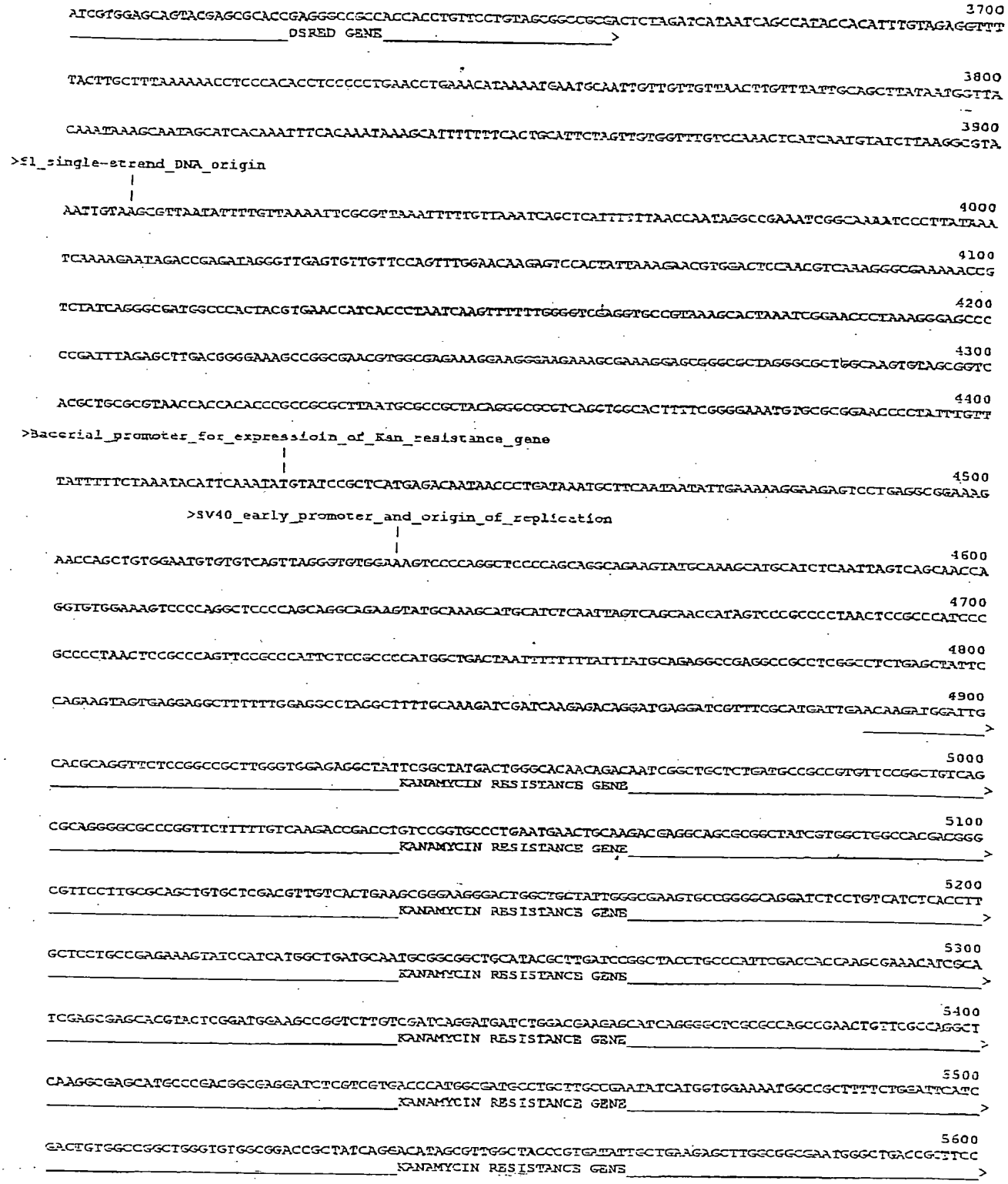

3700
ATCGTGGAGCAGTACGAGCGCACCGAGGGCCGCCACCACCTGTTCCTGTAGCGGCCGCGACTCTAGATCATAATCAGCCATACCACATTTGTAGAGGTTT
DSRED GENE
3800
TACTTGCTTTAAAAAACCTCCCACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGGTTA
3900
CAAATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTAAGGCGTA
>f1_single-strand_DNA_origin
4000
AATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTATAAA
4100
TCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCG
4200
TCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAGCCC
4300
CCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCGGTC
4400
ACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTT
>Bacerial_promoter_for_expressioin_of_Kan_resistance_gene
4500
TATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTCCTGAGGCGGAAAG
>SV40_early_promoter_and_origin_of_replication
4600
AACCAGCTGTGGAATGTGTGTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCA
4700
GGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCTAACTCCGCCCATCCC
4800
GCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATGGCTGACTAATTTTTTTTATTTATGCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTATTC
4900
CAGAAGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAGATCGATCAAGAGACAGGATGAGGATCGTTTCGCATGATTGAACAAGATGGATTG
5000
CACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGCCGTGTTCCGGCTGTCAG
KANAMYCIN RESISTANCE GENE
5100
CGCAGGGGCGCCCGGTTCTTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAACTGCAAGACGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGG
KANAMYCIN RESISTANCE GENE
5200
CGTTCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCATCTCACCTT
KANAMYCIN RESISTANCE GENE
5300
GCTCCTGCCGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAACATCGCA
KANAMYCIN RESISTANCE GENE
5400
TCGAGCGAGCACGTACTCGGATGGAAGCCGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACTGTTCGCCAGGCT
KANAMYCIN RESISTANCE GENE
5500
CAAGGCGAGCATGCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTCATC
KANAMYCIN RESISTANCE GENE
5600
GACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCC
KANAMYCIN RESISTANCE GENE

Fig. 9(B) cont.



(SEQ ID NO: 45)

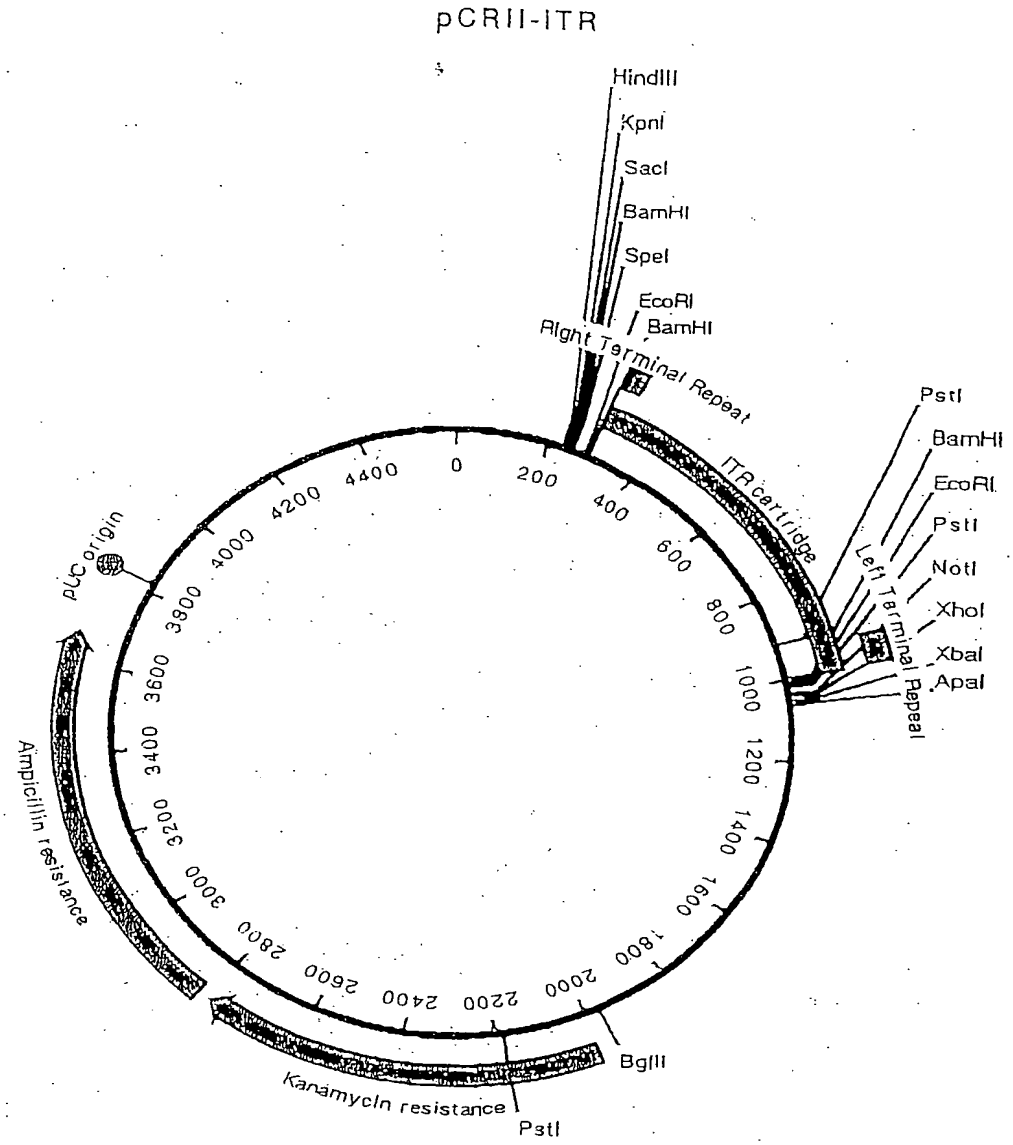

pCRII-ITR
HindIII
KpnI
SacI
BamHI
SpeI
EcoRI
BamHI
Right Terminal Repeat
ITR cartridge
PstI
BamHI
EcoRI
PstI
NotI
XhoI
XbaI
ApaI
Left Terminal Repeat
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
pUC origin
Ampicillin resistance
Kanamycin resistance
BglII
PstI

FIG. 10(A)

Sequence Range: 1 to 4613

100

AGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCT
GGCACGACAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAA

200

CGCAATTAATGTGAGTTAGCTCACTCATTAGGCACCCCAGGCTTTACACTTTATGCTT
CCGGCTCGTATGTTGTGTGGAATTGTGAGCGGATAACAATTT

300

CACACAGGAAACAGCTATGACCATGATTACGCCAAGCTTGGTACCGAGCTCGGATC
CACTAGTAACGGCCGCCAGTGTGCTGGAATTCGGCTTGGATCCC
_>

400

ATGCGTCAATTTTACGCAGACTATCTTTCTAGGGTTAATCTAGCTGCATCAGGATCAT
ATCGTCGGGTCTTTTTTCCGGCTCAGTCATCGCCCAAGCTGG
L H Q D H I V G S F F R L S H R P S W>
___B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=P____>
L H Q D H I V G S F F R L S H R P S W>
_____PROCESSED B; CODON_START=1
[SPLIT]_____>
_____RIGHT TERMINAL REPEAT_____>

500

CGCTATCTGGGCATCGGGGAGGAAGAAGCCCGTGCCTTTTCCCGCGAGGTTGAAGC
GGCATGGAAAGAGTTTGCCGAGGATGACTGCTGCTGCATTGACG
R Y L G I G E E E A R A F S R E V E A A W K E F A E D D C C C
I D>
_____B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=PID:G215108; TRA [SPLIT]_____>

FIG. 10(B)

R Y L G I G E E E A R A F S R E V E A A W K E F A E D D C C C
I D>

_____PROCESSED B; CODON_START=1
[SPLIT]_____>

600

TTGAGCGAAAACGCACGTTTACCATGATGATTCGGGAAGGTGTGGCCATGCACGCCT
TTAACGGTGAACTGTTCGTTCAGGCCACCTGGGATACCAGTTC
V E R K R T F T M M I R E G V A M H A F N G E L F V Q A T W
D T S S>

_____B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=PID:G215108; TRA [SPLIT]_____>
V E R K R T F T M M I R E G V A M H A F N G E L F V Q A T W
D T S S>

_____PROCESSED B; CODON_START=1
[SPLIT]_____>

700

GTCGCGGCTTTTCCGGACACAGTTCCGGATGGTCAGCCCGAAGCGCATCAGCAACCC
GAACAATACCGGCGACAGCCGGAACTGCCGTGCCGGTGTGCAG
S R L F R T Q F R M V S P K R I S N P N N T G D S R N C R A G
V Q>

_____B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=PID:G215108; TRA [SPLIT]_____>
S R L F R T Q F R M V S P K R I S N P N N T G D S R N C R A G
V Q>

_____PROCESSED B; CODON_START=1
[SPLIT]_____>

800

ATTAATGACAGCGGTGCGGCGCTGGGATATTACGTCAGCGAGGACGGGTATCCTGG
CTGGATGCCGCAGAAATGGACATGGATACCCCGTGAGTTACCCG
I N D S G A A L G Y Y V S E D G Y P G W M P Q K W T W I P R
E L P>

FIG. 10(B)

_____B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=PID:G215108; TRA [SPLIT]_____>
I N D S G A A L G Y Y V S E D G Y P G W M P Q K W T W I P R
E L P>
_____PROCESSED B; CODON_START=1
[SPLIT]_____>

900

GCGGGCGCGCCTCGTTCATTCACGTTTTTGAACCCGTGGAGGACGGGCAGACTCGCG
GTGCAAATGTGTTTTACAGCGTGATGGAGCAGATGAAGATGCT
G G R A S F I H V F E P V E D G Q T R G A N V F Y S V M E Q M
K M L>
_____B (CAPSID COMPONENT;533); CODON_START=1;
DB_XREF=PID:G215108; TRA [SPLIT]_____>
G G R A S F I H V F E P V E D G Q T R G A N V F Y S V M E Q M
K M L>
_____PROCESSED B; CODON_START=1
[SPLIT]_____>

1000

CGACACGCTGCAGAACACGCAGCTAGATTAACCCTAGAAAGATAATCATATTGTGA
CGTACGTTAAAGATAATCATGCGTAAAATTGACGCATGGGATCC
D T L Q N T Q> (SEQ ID NO: 47)
___B (CAPSID COMPO____>
D T L Q N T Q> (SEQ ID NO: 47)
___PROCESSED B; CO____>
_____LEFT TERMINAL
REPEAT_____>

1100

AAGCCGAATTCTGCAGATATCCATCACACTGGCGGCCGCTCGAGCATGCATCTAGAG
GGCCCAATTCGCCCTATAGTGAGTCGTATTACAATTCACTGGC

1200

FIG. 10(B)

CGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCAACTTAATCGCCT
TGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAG

1300

GCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGC
GCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGC

1400

GCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCC
TTCCTTTCTCGCCACGTTCGCCGGCTTTCCCCGTCAAGCTCT

1500

AAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGAGCTTTACGGCACCTCGACCGCAA
AAAACTTGATTTGGGTGATGGTTCACGTAGTGGGCCATCGCCC

1600

TGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCT
TGTTCCAAACTGGAACAACACTCAACCCTATCGCGGTCTATT

1700

CTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGAT
TTAACAAATTCAGGGCGCAAGGGCTGCTAAAGGAACCGGAAC

1800

ACGTAGAAAGCCAGTCCGCAGAAACGGTGCTGACCCCGGATGAATGTCAGCTACTG
GGCTATCTGGACAAGGGAAAACGCAAGCGCAAAGAGAAAGCAGG

1900

TAGCTTGCAGTGGGCTTACATGGCGATAGCTAGACTGGGCGGTTTTATGGACAGCAA
GCGAACCGGAATTGCCAGCTGGGGCGCCCTCTGGTAAGGTTGG

FIG. 10(B)

2000

GAAGCCCTGCAAAGTAAACTGGATGGCTTTCTTGCCGCCAAGGATCTGATGGCGCA
GGGGATCAAGATCTGATCAAGAGACAGGATGAGGATCGTTTCGC

2100

ATGATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCT
ATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATG

2200

CCGCCGTGTTCCGGCTGTCAGCGCAGGGGCGCCCGGTTCTTTTTGTCAAGACCGACC
TGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCT

2300

ATCGTGGCTGGCCACGACGGGCGTTCCTTGCGCAGCTGTGCTCGACGTTGTCACTGA
AGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGGCAG

2400

GATCTCCTGTCATCTCGCCTTGCTCCTGCCGAGAAAGTATCCATCATGGCTGATGCA
ATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCG

2500

ACCACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGCCGGTCTT
GTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCC

2600

AGCCGAACTGTTCGCCAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCG
TGATCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAAT

2700

GGCCGCTTTTCTGGATTCAACGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAG

FIG. 10(B)

GACATAGCGTTGGATACCCGTGATATTGCTGAAGAGCTTGGCG

2800

GCGAATGGGCTGACCGCTTCCTCGTGCTTTACGGTATCGCCGCTCCCGATTCGCAGC
GCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAATTGA

2900

AAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGG
CATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGGTGA

3000

AAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGAT
CTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACG

3100

TTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTCATACACTATTATCCCGTATT
GACGCCGGGCAAGAGCAACTCGGTCGCCGGGCGCGGTATTCT

3200

CAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCAT
GACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATA

3300

ACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCT
TTTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTG

3400

GGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGAGTGACACCACGATGCCTG
TAGCAATGCCAACAACGTTGCGCAAACTATTAACTGGCGAACTA

3500

FIG. 10(B)

CTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTG

3600

CTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC
CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGG

3700

GAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCAC
TGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATA

3800

CTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTT
TTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGT

3900

TCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT
TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCT

4000

ACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAC
TGGCTTCAGCAGAGCGCAGATACCAAATACTGTCCTTCTAGTG

4100

TAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGT

4200

CGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCG
GGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAAC

FIG. 10(B)

4300

GACCTACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTC
CCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTC

4400

GGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAG
TCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGT

4500

GATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTA
CGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCC

4600

TGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACC
GCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGC

GAGGAAGCGGAAG (SEQ ID NO: 46)

FIG. 10(B)

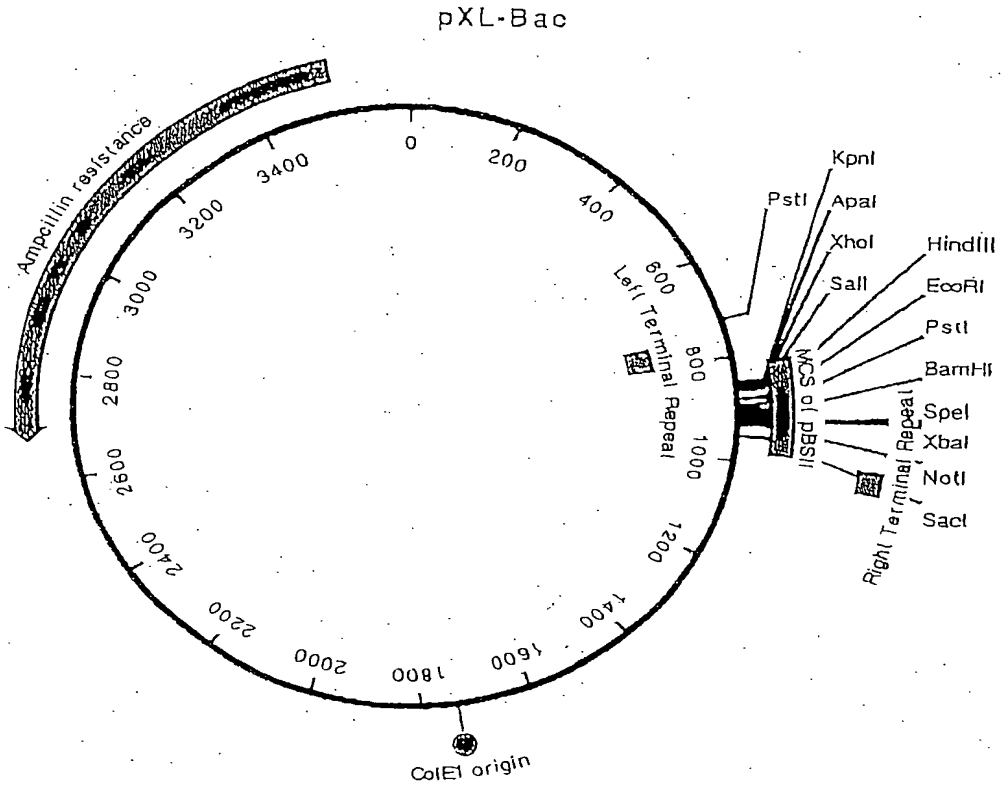

pXL-Bac
Ampicillin resistance
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
Left Terminal Repeat
pBSII SKM
MCS
KpnI
PstI
ApaI
XhoI
HindIII
SalI
EcoRI
PstI
BamHI
SpeI
XbaI
NotI
SacI
Right Terminal Repeat
ColE1 origin

FIG. 11

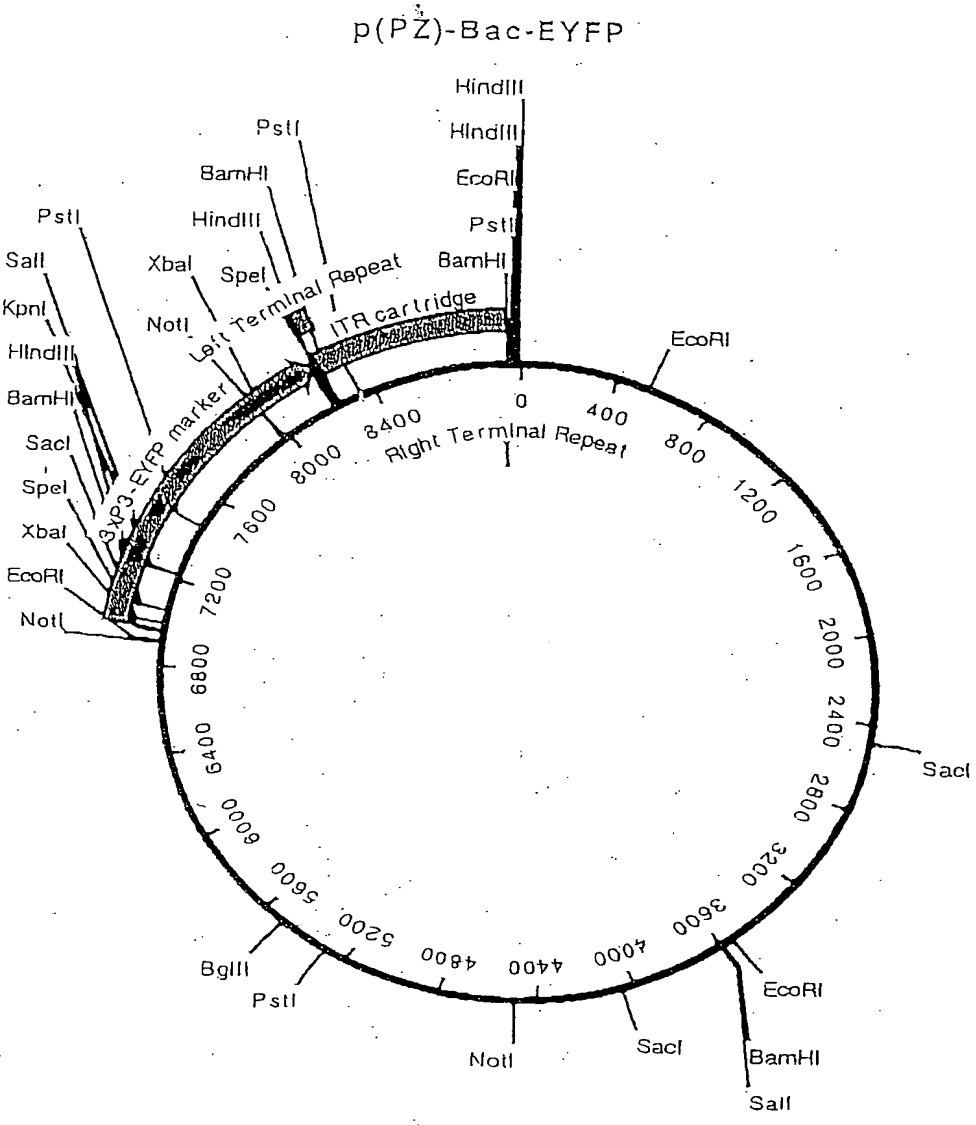

p(PZ)-Bac-EYFP
HindIII
HindIII
EcoRI
PstI
BamHI
ITR cartridge
Right Terminal Repeat
Left Terminal Repeat
SpeI
HindIII
BamHI
PstI
XbaI
NotI
3xP3-EYFP marker
SalI
KpnI
HindIII
BamHI
SacI
SpeI
XbaI
EcoRI
NotI
0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
4800
5200
5600
6000
6400
6800
7200
7600
8000
8400
EcoRI
SacI
EcoRI
BamHI
SalI
SacI
NotI
PstI
BglII

FIG. 12(A)

p(2?)-Bac-2YFP

FIG. 12(B)

Sequence Range: 1 to 9999

100
ACCGAAGTATACACTTAAATTCAGTGCACGTTTGCTTGTTGAGAGGAAAGGTTGTGTGCGGACGAATTTTTTTTTGAAAACATTAACCCTTACGTGGAAT

200
AAAAAAAAATGAAATATTGCAAATTTTGCTGCAAAGCTGTGACTGGAGTAAAATTAATTCACGTGCCGAAGTGTGCTATTAAGAGAAAATTGTGGGAGCA

300
GAGCCTTGGGTGCAGCCTTGGTGAAAACTCCCAAATTTGTGATACCCACTTTAATGATTCGCAGTGGAAGGCTGCACCTGCAAAAGGTCAGACATTTAAA

400
AGGAGGCGACTCAACGCAGATGCCGTACCTAGTAAAGTGATAGAGCCTGAACCAGAAAAGATAAAAGAAGGCTATACCAGTGGGAGTACACAAACAGAGT

500
AAGTTTGAATAGTAAAAAAAATCATTTATGTAAACAATAACGTGACTGTGCGTTAGGTCCTGTTCATTGTTTAATGAAAATAAGAGCTTGAGGGAAAAAA

600
TTCGTACTTTGGAGTACGAAATGCGTCGTTTAGAGCAGCAGCCGAATTCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCA

700
ACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGC

800
GAATGGCGCTTTGCCTGGTTTCCGGCACCAGAAGCGGTGCCGGAAAGCTGGCTGGAGTGCGATCTTCCTGAGGCCGATACTGTCGTCGTCCCCTCAAACT

900
GGCAGATGCACGGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATTACGGTCAATCCGCCGTTTGTTCCCACGGAGAATCCGACGGGTTGTTA

1000
CTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGCAACGGG

1100
CGCTGGGTCGGTTACGGCCAGGACAGTCGTTTGCCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGC

1200
GTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAG

1300
CGATTTCCATGTTGCCACTCGCTTTAATGATGATTTCAGCCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTA

1400
ACAGTTTCTTTATGGCAGGGTGAAACGCAGGTCGCCAGCGGCACCGCGCCTTTCGGCGGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCA

1500
CACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACTGCACACCGCCGACGGCACGCTGAT

1600
TGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGT

1700
CACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTT

1800
CGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAAT

1900
GAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGG

2000
TCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCG

2100
GAGCCGACACCACGGCCACCGATATTATTTGCCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATG

2200
GCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTT

2300
CGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCG

2400
GTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAACAGCA

2500
GCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTG

FIG. 12(B) cont.

2600
GCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGA

2700
GCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGC

2800
GGAAAACCTCAGTGTGACGCTCCCCGCCGCGTCCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGG

2900
CAATTTAACCGCCAGTCAGGCTTTCTTTCACAGATGTGGATTGGCGATAAAAAACAACTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGG

3000
ATAACGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTAACGCCTGGGTCGAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTT

3100
GCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTAC

3200
CGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGC

3300
AGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACTATCCCGACCGCCTTACTGCCGCCTGTTTTGACCGCTGGGATCTGCCATTGTC

3400
AGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACTTCCAG

3500
TTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCC

3600
ATATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTCGGGG

3700
ATCCGTCGACTAAGGCCAAAGAGTCTAATTTTTGTTCATCAATGGGTTATAACATATGGGTTATATTATAAGTTTGTTTTAAGTTTTTGAGACTGATAAG

3800
AATGTTTCGATCGAATATTCCATAGAACAACAATAGTATTACCTAATTACCAAGTCTTAATTTAGCAAAAATGTTATTGCTTATAGAAAAAATAAATTAT

3900
TTATTTGAAATTTAAAGTCAACTTGTCATTTAATGTCTTGTAGACTTTTGAAAGTCTTACGATACAATTAGTATCTAATATACATGGGTTCATTCTACAT

4000
TCTATATTAGTGATGATTTCTTTAGCTAGTAATACATTTTAATTATATTCGGCTTTGATGATTTTCTGATTTTTTCCGAACGGATTTTCGTAGACCCTTT

4100
CGATCTCATAATGGCTCATTTTATTGCGATGGACGGTCACGAGAGCTCCACTTTTGAATTTCTGTTCGCAGACACCGCATTTGTAGCACATAGCCGGGAC

4200
ATCCGGTTTGGGGAGATTTTCCAGTCTCTGTTGCAATTGGTTTTCGGGAATGCGTTGCAGGCGCATACGCTCTATATCCTCCGAACGGCGCTGGTTGACC

4300
CTAGCATTTACATAAGGATCAGCAGCAAAATTTGCCTCTGCTTCATTGCCCGGAATCACAGCAATCAGATGTCCCTTTCGGTTACGATGGATATTCAGGT

4400
GCGAACCGCACACAAAGCTCTCGCCGCACACTCCACACTGATATGGTCGCTCGCCGTGTGGCGCCGCATATGGATCTTAAGGTCGTTGGACTGCACAAAG

4500
CTCTTGCTGCACATTTTGCAGGAGTACGGCCTTTGACCCGTGTGCAATCGCATGTGTCGCGCCAGCTTGTTCTGCGAAATAAACTTCTTGGAGCAGATGC

4600
GGCCGCCCGGGGTGGGCGAAGAACTCCAGCATGAGATCCCCGCGCTGGAGGATCATCCAGCCGGCGTCCCGGAAAACGATTCCGAAGCCCAACCTTTCAT

4700
AGAAGGCGGCGGTGGAATCGAAATCTCGTGATGGCAGGTTGGGCGTCGCTTGGTCGGTCATTTCGAACCCCAGAGTCCCGCTCAGAAGAACTCGTCAAGA

4800
AGGCGATAGAAGGCGATGCGCTGCGAATCGGGAGCGGCGATACCGTAAAGCACGAGGAAGCGGTCAGCCCATTCGCCGCCAAGCTCTTCAGCAATATCAC

4900
GGGTAGCCAACGCTATGTCCTGATAGCGGTCCGCCACACCCAGCCGGCCACAGTCGATGAATCCAGAAAAGCGGCCATTTTCCACCATGATATTCGGCAA

5000
GCAGGCATCGCCATGGGTCACGACGAGATCCTCGCCGTCGGGCATGCGCGCCTTGAGCCTGGCGAACAGTTCGGCTGGCGCGAGCCCCTGATGCTCTTCG

FIG. 12(B) cont.

5100
TCCAGATCATCCTGATCGACAAGACCGGCTTCCATCCGAGTACGTGCTCGCTCGATGCGATGTTTCGCTTGGTGGTCGAATGGGCAGGTAGCCGGATCAA

5200
GCGTATGCAGCCGCCGCATTGCATCAGCCATGATGGATACTTTCTCGGCAGGAGCAAGGTGAGATGACAGGAGATCCTGCCCCGGCACTTCGCCCAATAG

5300
CAGCCAGTCCCTTCCCGCTTCAGTGACAACGTCGAGCACAGCTGCGCAAGGAACGCCCGTCGTGGCCAGCCACGATAGCCGCGCTGCCTCGTCCTGCAGT

5400
TCATTCAGGGCACCGGACAGGTCGGTCTTGACAAAAAGAACCGGGCGCCCCTGCGCTGACAGCCGGAACACGGCGGCATCAGAGCAGCCGATTGTCTGTT

5500
GTGCCCAGTCATAGCCGAATAGCCTCTCCACCCAAGCGGCCGGAGAACCTGCGTGCAATCCATCTTGTTCAATCATGCGAAACGATCCTCATCCTGTCTC

5600
TTGATCAGATCTTGATCCCCTGCGCCATCAGATCCTTGGCGGCAAGAAAGCCATCCAGTTTACTTTGCAGGGCTTCCCAACCTTACCAGAGGGCGCCCCA

5700
GCTGGCAATTCCGGTTCGCTTGCTGTCCATAAAACCGCCCAGTCTAGCTATCGCCATGTAAGCCCACTGCAAGCTACCTGCTTTCTCTTTGCGCTTGCGT

5800
TTTCCCTTGTCCAGATAGCCCAGTAGCTGACATTCATCCGGGGTCAGCACCGTTTCTGCGGACTGGCTTTCTACGTGTTCCGCTTCCTTTAGCAGCCCTT

5900
GCGCCCTGAGTGCTTGCGGCAGCGTGAAGCTAATTCATGGTTATAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCC

6000
CTTATAAATCAAAAGAATAGCCCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCG

6100
AAAAACCGTCTATCAGGGCGATGGCCCGGATCAGCTTATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAAATACCGCATCAGGCGCTCTTCCGCTT

6200
CCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAA

6300
CGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAG

6400
CATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTG

6500
TTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTA

6600
GGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGA

6700
CACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACG

6800
GCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGC

6900
TGGTAGCGGCGGTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTTACTGAACGGTGATCCCCA

7000
CCGGAATTGCGGCCGCGGAATTCTCATGTTTGACAGCTTATCATCGATAAGCTGGCCGCTCTAGAACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCC
3XP3-SYFP MARKER>

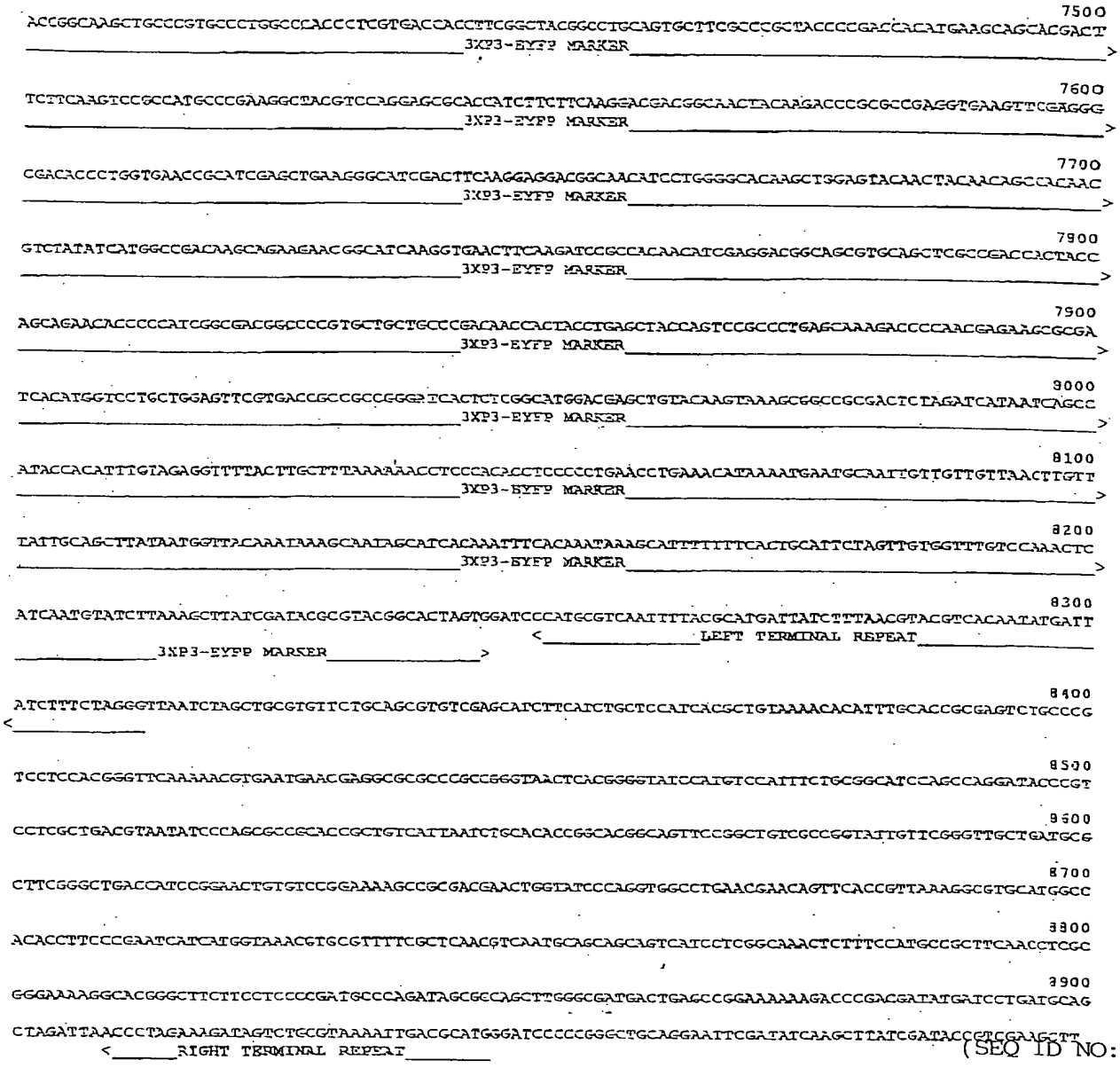
7100
CGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCAATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGTATAAATAGA
3XP3-SYFP MARKER>

7200
GGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTGAACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGCTA
3XP3-SYFP MARKER>

7300
AACAATCGGGGTACCGCTAGAGTCGACGGTACGATCCACCGGTCGCCACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGT
3XP3-SYFP MARKER>

7400
CGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACC
3XP3-SYFP MARKER>

FIG. 12(B) cont.



(SEQ ID NO: 48

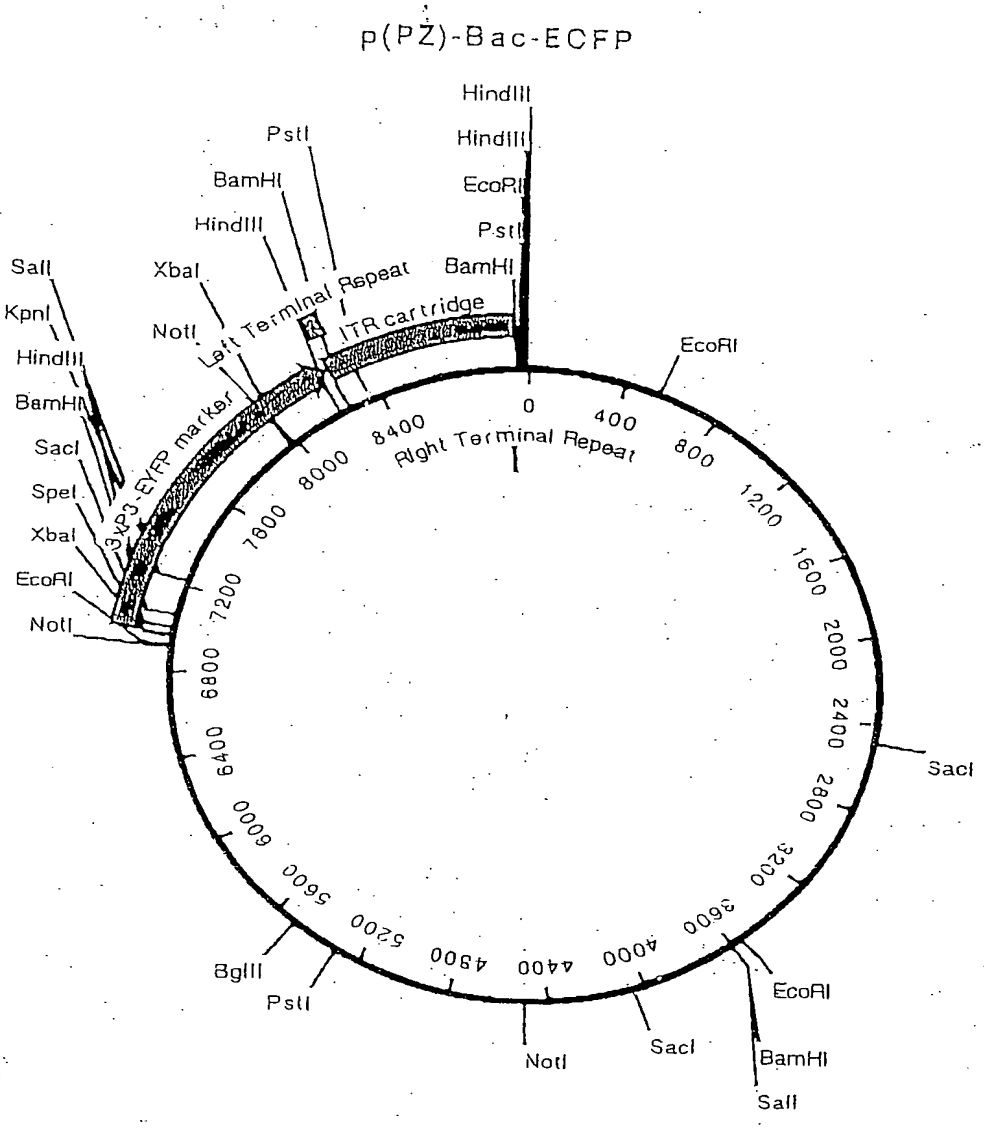

p(PZ)-Bac-ECFP
HindIII
HindIII
EcoRI
PstI
BamHI
PstI
BamHI
HindIII
XbaI
NotI
Left Terminal Repeat
ITR cartridge
SalI
KpnI
HindIII
BamHI
SacI
SpeI
XbaI
EcoRI
NotI
3xP3-EYFP marker
EcoRI
0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
4800
5200
5600
6000
6400
6800
7200
7600
8000
8400
Right Terminal Repeat
SacI
EcoRI
BamHI
SalI
NotI
SacI
BglII
PstI

FIG. 13 (A)

p(9Z)-Bac-ECFP

FIG. 13(B)

Sequence Range: 1 to 9012

100
ACCGAAGTATACACTTAAATTCAGTGCACGTTTGCTTGTTGAGAGGAAAGGTTGTGTGCGGACGAATTTTTTTTTGAAAACATTAACCCTTACGTGGAAT

200
AAAAAAAAATGAAATATTGCAAATTTTGCTGCAAAGCTGTGACTGGAGTAAAATTAATTCACGTGCCGAAGTGTGCTATTAAGAGAAAATTGTGGGAGCA

300
GAGCCTTGGGTGCAGCCTTGGTGAAAACTCCCAAATTTGTGATACCCACTTTAATGATTCGCAGTGGAAGGCTGCACCTGCAAAAGGTCAGACATTTAAA

400
AGGAGGCGACTCAACGCAGATGCCGTACCTAGTAAAGTGATAGAGCCTGAACCAGAAAAGATAAAAGAAGGCTATACCAGTGGGAGTACACAAACAGAGT

500
AAGTTTGAATAGTAAAAAAAATCATTTATGTAAACAAATAACGTGACTGTGCGTTAGGTCCTGTTCATTGTTTAATGAAAATAAGAGCTTGAGGGAAAAAA

600
TTCGTACTTTGGAGTACGAAATGCGTCGTTTAGAGCAGCAGCCGAATTCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCA

700
ACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGC

800
GAATGGCGCTTTGCCTGGTTTCCGGCACCAGAAGCGGTGCCGGAAAGCTGGCTGGAGTGCGATCTTCCTGAGGCCGATACTGTCGTCGTCCCCTCAAACT

900
GGCAGATGCACGGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATTACGGTCAATCCGCCGTTTGTTCCCACGGAGAATCCGACGGGTTGTTA

1000
CTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGCAACGGG

1100
CGCTGGGTCGGTTACGGCCAGGACAGTCGTTTGCCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGC

1200
GTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAG

1300
CGATTTCCATGTTGCCACTCGCTTTAATGATGATTTCAGCCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTA

1400
ACAGTTTCTTTATGGCAGGGTGAAACGCAGGTCGCCAGCGGCACCGCGCCTTTCGGCGGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCA

1500
CACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACTGCACACCGCCGACGGCACGCTGAT

1600
TGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGT

1700
CACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTT

1800
CGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAAT

1900
GAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGG

2000
TCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCG

2100
GAGCCGACACCACGGCCACCGATATTATTTGCCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATG

2200
GCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTT

2300
CGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCG

2400
GTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAAACACCA

2500
GCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTG

FIG. 13(B) cont.

2600
GCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGA

2700
GCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGC

2800
GGAAAACCTCAGTGTGACGCTCCCCGCCGCGTCCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGG

2900
CAATTTAACCGCCAGTCAGGCTTTCTTTCACAGATGTGGATTGGCGATAAAAAACAACTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGG

3000
ATAACGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTAACGCCTGGGTCGAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTT

3100
GCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTAC

3200
CGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGC

3300
AGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACTATCCCGACCGCCTTACTGCCGCCTGTTTTGACCGCTGGGATCTGCCATTGTC

3400
AGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACTTCCAG

3500
TTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCC

3600
ATATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTCGGGG

3700
ATCCGTCGACTAAGGCCAAAGAGTCTAATTTTTGTTCATCAATGGGTTATAACATATGGGTTATATTATAAGTTTGTTTTAAGTTTTTGAGACTGATAAG

3800
AATGTTTCGATCGAATATTCCATAGAACAACAATAGTATTACCTAATTACCAAGTCTTAATTTAGCAAAAATGTTATTGCTTATAGAAAAAATAAATTAT

3900
TTATTTGAAATTTAAAGTCAACTTGTCATTTAATGTCTTGTAGACTTTTGAAAGTCTTACGATACAATTAGTATCTAATATACATGGGTTCATTCTACAT

4000
TCTATATTAGTGATGATTTCTTTAGCTAGTAATACATTTTAATTATATTCGGCTTTGATGATTTTCTGATTTTTTTCCGAACGGATTTTCGTAGACCCTTT

4100
CGATCTCATAATGGCTCATTTTATTGCGATGGACGGTCAGGAGAGCTCCACTTTTGAATTTCTGTTCGCAGACACCGCATTTGTAGCACATAGCCGGGAC

4200
ATCCGGTTTGGGGACATTTTCCAGTCTCTGTTGCAATTGGTTTTCGGGAATGCGTTGCAGGGCATACGCTCTATATCCTCCGAACGGCGCTGGTTGACC

4300
CTAGCATTTACATAAGGATCAGCAGCAAAATTTGCCTCTGCTTCATTGCCCGGAATCACAGCAATCAGATGTCCCTTTCGGTTACGATGGATATTCAGGT

4400
GCGAACCGCACACAAAGCTCTCGCCGCACACTCCACACTGATATGGTCGCTCGCCTGTGGCGCCGCATATGGATCTTAAGGTCGTTGGACTGCACAAAG

4500
CTCTTGCTGCACATTTTGCAGGAGTACGGCCTTTGACCCGTGTGCAATCGCATGTGTCGCGCCAGCTTGTTCTGCGAAATAAACTTCTTGGAGCAGATGC

4600
GGCCGCCCGGGGTGGGCGAAGAACTCCAGCATGAGATCCCCGCGCTGGAGGATCATCCAGCCGGCGTCCCGGAAAACGATTCCGAAGCCCAACCTTTCAT

4700
AGAAGGCGGCGGTGGAATCGAAATCTCGTGATGGCAGGTTGGGCGTCGCTTGGTCGGTCATTTCGAACCCCAGAGTCCCGCTCAGAAGAACTCGTCAAGA

4800
AGGCGATAGAAGGCGATGCGCTGCGAATCGGGAGCGGCGATACCGTAAAGCACGAGGAAGCGGTCAGCCCATTCGCCGCCAAGCTCTTCAGCAATATCAC

4900
GGGTAGCCAACGCTATGTCCTGATAGCGGTCCGCCACACCCAGCCGGCCACAGTCGATGAATCCAGAAAAGCGGCCATTTTCCACCATGATATTCGGCAA

5000
GCAGGCATCGCCATGGGTCACGACGAGATCCTCGCCGTCGGGCATGCGCGCCTTGAGCCTGGCGAACAGTTCGGCTGGCGCGAGCCCCTGATGCTCTTCG

FIG. 13(B) cont.

5100
TCCAGATCATCCTGATCGACAAGACCGGCTTCCATCCGAGTACGTGCTCGCTCGATGCGATGTTTCGCTTGGTGGTCGAATGGGCAGGTAGCCGGATCAA

5200
GCGTATGCAGCCGCCGCATTGCATCAGCCATGATGGATACTTTCTCGGCAGGAGCAAGGTGAGATGACAGGAGATCCTGCCCCGGCACTTCGCCCAATAG

5300
CAGCCAGTCCCTTCCCGCTTCAGTGACAACGTCGAGCACAGCTGCGCAAGGAACGCCCGTCGTGGCCAGCCACGATAGCCGCGCTGCCTCGTCCTGCAGT

5400
TCATTCAGGGCACCGGACAGGTCGGTCTTGACAAAAAGAACCGGGCGCCCCTGCGCTGACAGCCGGAACACGGCGGCATCAGAGCAGCCGATTGTCTGTT

5500
GTGCCCAGTCATAGCCGAATAGCCTCTCCACCCAAGCGGCCGGAGAACCTGCGTGCAATCCATCTTGTTCAATCATGCGAAACGATCCTCATCCTGTCTC

5600
TTGATCAGATCTTGATCCCCTGCGCCATCAGATCCTTGGCGGCAAGAAAGCCATCCAGTTTACTTTGCAGGGCTTCCCAACCTTACCAGAGGGCGCCCCA

5700
GCTGGCAATTCCGGTTCGCTTGCTGTCCATAAAACCGCCCAGTCTAGCTATCGCCATGTAAGCCCACTGCAAGCTACCTGCTTTCTCTTTGCGCTTGCGT

5800
TTTCCCTTGTCCAGATAGCCCAGTAGCTGACATTCATCCGGGGTCAGCACCGTTTCTGCGGACTGGCTTTCTACGTGTTCCGCTTCCTTTAGCAGCCCTT

5900
GCGCCCTGAGTGCTTGCGGCAGCGTGAAGCTAATTCATGGTTATAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCC

6000
CTTATAAATCAAAAGAATAGCCCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCG

6100
AAAAACCGTCTATCAGGGCGATGGCCCGGATCAGCTTATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAAATACCGCATCAGGCGCTCTTCCGCTT

6200
CCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAA

6300
CGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAG

6400
CATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTG

6500
TTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTA

6600
GGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGA

6700
CACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACG

6800
GCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGC

6900
TGGTAGCGGCGGTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTTACTGAACGGTGATCCCCA

7000
CCGGAATTGCGGCCGCGGAATTCTCATGTTTGACAGCTTATCATCGATAAGCTGGCCGCTCTAGAACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCC
_____3XP3-EYFP MARKER _____>

7100
CGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCAATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGCTCTAAATAGA
_____3XP3-EYFP MARKER _____>

7200
GGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTGAACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGCTA
_____3XP3-EYFP MARKER _____>

7300
AACAATCGGGGTACCGCTAGAGTCGACGGTACCATCCACCGGTCGCCACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGT
_____3XP3-EYFP MARKER _____>

7400
CGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACC
_____3XP3-EYFP MARKER _____>

FIG. 13(B) cont.

7500
ACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCCTGACCTGGGGCGTGCAGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACT
_____3XP3-EYFP MARKER _____>

7600
TCTTCAAGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGG
_____3XP3-EYFP MARKER _____>

7700
CGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACTACATCAGCCACAAC
_____3XP3-EYFP MARKER _____>

7800
GTCTATATCACCGCCGACAAGCAGAAGAACGGCATCAAGGCCAACTTCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACC
_____3XP3-EYFP MARKER _____>

7900
AGCAGAACACCCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAACCACTACCTGAGCACCCAGTCCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGA
_____3XP3-EYFP MARKER _____>

8000
TCACATGGTCCTGCTGGAGTTCGTGACCGCCGCCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCGACTCTAGATCATAATCAGCC
_____3XP3-EYFP MARKER _____>

8100
ATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCCACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTT
_____3XP3-EYFP MARKER _____>

8200
TATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTC
_____3XP3-EYFP MARKER _____>

8300
ATCAATGTATCTTAAAGCTTATCGATACGCGTACGGCGCGCCTAGGCCGGCCGATTGGATCCCATGCGTCAATTTTACGCATGATTATCTTTAACGTACG
<_____LEFT TERMINAL REPEAT_____
_____3XP3-EYFP MARKER _____>

8400
TCACAATAATGATTATCTTTCTAGGGTTAATCTAGCTGCGTGTTCTGCAGCGTGTCGAGCATCTTCATCTGCTCCATCACGCTGTAAAACACATTTGCACC
<___LEFT TERMINAL REPE____

8500
GCGAGTCTGCCCGTCCTCCACGGGTTCAAAAACGTGAATGAACGAGGCGCGCCCGCCGGGTAACTCACGGGGTATCCATGTCCATTTCTGCGGCATCCAG

8600
CCAGGATACCCGTCCTCGCTGACGTAATATCCCAGCGCCGCACCGCTGTCATTAATCTGCACACCGGCACGGCAGTTCCGGCTGTCGCCGGTATTGTTCG

8700
GGTTGCTGATGCGCTTCGGGCTGACCATCCGGAACTGTGTCCGGAAAAGCCGCGACGAACTGGTATCCCAGGTGGCCTGAACGAACAGTTCACCGTTAAA

8800
GGCGTGCATGGCCACACCTTCCCGAATCATCATGGTAAACGTGCGTTTTCGCTCAACGTCAATGCAGCAGCAGTCATCCTCGGCAAACTCTTTCCATGCC

8900
GCTTCAACCTCGCGGGAAAAGGCACGGGCTTCTTCCTCCCCGATGCCCAGATAGCGCCAGCTTGGGCGATGACTGAGCCGGAAAAAAGACCCGACGATAT

9000
GATCCTGATGCAGCTAGATTAACCCTAGAAAGATAGTCTGCGTAAAATTGACGCATGGGATCCCCCGGGCTGCAGGAATTCGATATCAAGCTTATCGATA
<_____RIGHT TERMINAL REPEAT_____

CCGTCGAAGCTT (SEQ ID NO: 49)

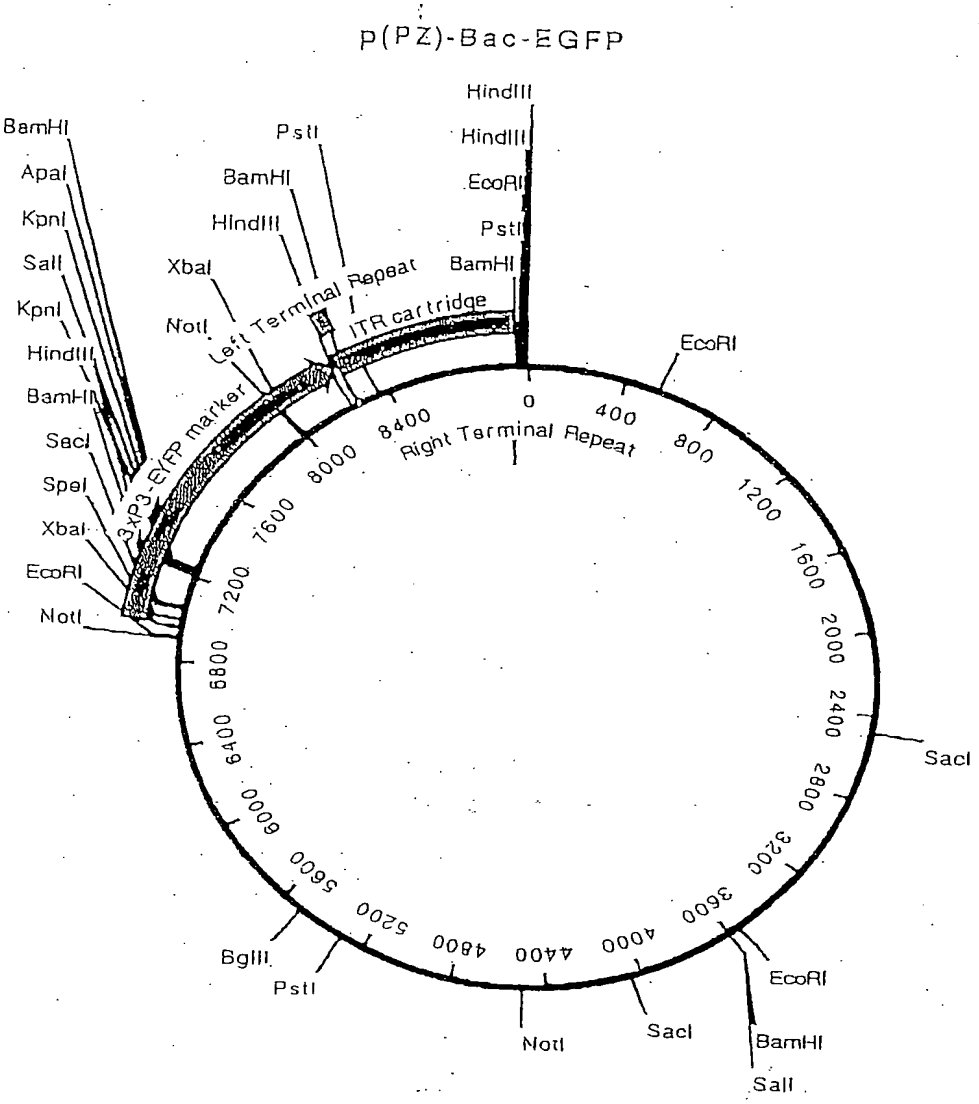

P(PZ)-Bac-EGFP
HindIII
HindIII
EcoRI
PstI
BamHI
PstI
BamHI
HindIII
XbaI
NotI
Left Terminal Repeat
ITR cartridge
BamHI
ApaI
KpnI
SalI
KpnI
HindIII
BamHI
SacI
SpeI
XbaI
EcoRI
NotI
3xP3-EYFP marker
EcoRI
0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
4800
5200
5600
6000
6400
6800
7200
7600
8000
8400
Right Terminal Repeat
SacI
EcoRI
BamHI
SalI
SacI
NotI
PstI
BglII

FIG. 14 (A)

FIG. 14(B)

P(22)-Bac-EGFP

Sequence Range: 1 to 9013

100
ACCGAAGTATACACTTAAATTCAGTGCACGTTTGCTTGTTGAGAGGAAAGGTTGTGTGCGGACGAATTTTTTTTTGAAAACATTAACCCTTACGTGGAAT

200
AAAAAAAAATGAAATATTGCAAATTTTGCTGCAAAGCTGTGACTGGAGTAAAATTAATTCACGTGCCGAAGTGTGCTATTAAGAGAAAATTGTGGGAGCA

300
GAGCCTTGGGTGCAGCCTTGGTGAAAACTCCCAAATTTGTGATACCCACTTTAATGATTCGCAGTGGAAGGCTGCACCTGCAAAAGGTCAGACATTTAAA

400
AGGAGGCGACTCAACGCAGATGCCGTACCTAGTAAAGTGATAGAGCCTGAACCAGAAAAGATAAAAGAAGGCTATACCAGTGGGAGTACACAAACAGAGT

500
AAGTTTGAATAGTAAAAAAAAATCATTTATGTAAACAATAACGTGACTGTGCGTTAGGTCCTGTTCATTGTTTAATGAAAATAAGAGCTTGACGGAAAAAA

600
TTCGTACTTTGGAGTACGAAATGCGTCGTTTAGAGCAGCAGCCGAATTCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCCTGGCGTTACCCA

700
ACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGC

800
GAATGGCGCTTTGCCTGGTTTCCGGCACCAGAAGCGGTGCCGGAAAGCTGGCTGGAGTGCGATCTTCCTGAGGCCGATACTGTCGTCGTCCCCTCAAACT

900
GGCAGATGCACGGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATTACGGTCAATCCGCCGTTTGTTCCCACGGAGAATCCGACGGGTTGTTA

1000
CTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGCAACGGG

1100
CGCTGGGTCGGTTACGGCCAGGACAGTCGTTTGCCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGC

1200
GTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAG

1300
CGATTTCGATGTTGCCACTCGCTTTAATGATGATTTCAGCCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTA

1400
ACAGTTTCTTTATGGCAGGGTGAAACGCAGGTCGCCAGCGGCACCGCGCCTTTCGGCGGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCA

1500
CACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACTGCACACCGCCGACGGCACGCTGAT

1600
TGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGT

1700
CACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTT

1800
CGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAAT

1900
GAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGG

2000
TCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCCGCCCCGGTGCAGTATGAAGGCGGCG

2100
GAGCCGACACCACGGCCACCGATATTATTTGCCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCCGGCTGTGCCGAAATGGTCCATCAAAAAATG

2200
GCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTT

2300
CGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCG

2400
GTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAAACACCA

2500
GCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTG

FIG. 14(B) cont.

2600
GCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGA

2700
GCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGC

2800
GGAAAACCTCAGTGTGACGCTCCCCGCCGCGTCCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGG

2900
CAATTTAACCGCCAGTCAGGCTTTCTTTCACAGATGTGGATTGGCGATAAAAAACAACTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGG

3000
ATAACGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTAACGCCTGGGTCGAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTT

3100
GCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTAC

3200
CGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGC

3300
AGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACTATCCCGACCGCCTTACTGCCGCCTGTTTTGACCGCTGGGATCTGCCATTGTC

3400
AGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACTTCCAG

3500
TTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCC

3600
ATATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTCGGGG

3700
ATCCGTCGACTAAGGCCAAAGAGTCTAATTTTTGTTCATCAATGGGTTATAACATATGGGTTATATTATAAGTTTGTTTTAAGTTTTTGAGACTGATAAG

3800
AATGTTTCGATCGAATATTCCATAGAACAACAATAGTATTACCTAATTACCAAGTCTTAATTTAGCAAAAATGTTATTGCTTATAGAAAAAATAAATTAT

3900
TTATTTGAAATTTAAAGTCAACTTGTCATTTAATGTCTTGTAGACTTTTGAAAGTCTTACGATACAATTAGTATCTAATATACATGGGTTCATTCTACAT

4000
TCTATATTAGTGATGATTCTTTAGCTAGTAATACATTTTAATTATATTCGGCTTTGATGATTTTCTGATTTTTTCCGAACGGATTTTCGTAGACCCTTT

4100
CGATCTCATAATGGCTCATTTTATTGCGATGGACGGTCAGGAGAGCTCCACTTTTGAATTTCTGTTCGCAGACACCGCATTTGTAGCACATAGCCGGGAC

4200
ATCCGGTTTGGGGAGATTTTCCAGTCTCTGTTGCAATTGGTTTTCGGGAATGCGTTGCAGGCGCATACGCTCTATATCCTCCGAACGGCGCTGGTTGACC

4300
CTAGCATTTACATAAGGATCAGCAGCAAAATTTGCCTCTGCTTCATTGCCCGGAATCACAGCAATCAGATGTCCCTTTCGGTTACGATGGATATTCAGGT

4400
GCGAACCGCACACAAAGCTCTCGCCGCACACTCCACACTGATATGGTCGCTCGCCCTGTGGCGCCGCATATGGATCTTAAGGTCGTTGGACTGCACAAAG

4500
CTCTTGCTGCACATTTTGCAGGAGTACGGCCTTTGACCCGTGTGCAATCGCATGTGTCGCGCCAGCTTGTTCTGCGAAATAAACTTCTTGGAGCAGATGC

4600
GGCCGCCCGGGGTGGGCGAAGAACTCCAGCATGAGATCCCCGCGCTGGAGGATCATCCAGCCGGCGTCCCGGAAAACGATTCCGAAGCCCAACCTTTCAT

4700
AGAAGGCGGCGGTGGAATCGAAATCTCGTGATGGCAGGTTGGGCGTCGCTTGGTCGGTCATTTCGAACCCCAGAGTCCCGCTCAGAAGAACTCGTCAAGA

4800
AGGCGATAGAAGGCGATGCGCTGCGAATCGGGAGCGGCGATACCGTAAAGCACGAGGAAGCGGTCAGCCCATTCGCCGCCAAGCTCTTCAGCAATATCAC

4900
GGGTAGCCAACGCTATGTCCTGATAGCGGTCCGCCACACCCAGCCGGCCACAGTCGATGAATCCAGAAAAGCGGCCATTTTCCACCATGATATTCGGCAA

5000
GCAGGCATCGCCATGGGTCACGACGAGATCCTCGCCGTCGGGCATGCGCGCCTTGAGCCTGGCGAACAGTTCGGCTGGCGCGAGCCCCTGATGCTCTTCG

FIG. 14(B) cont.

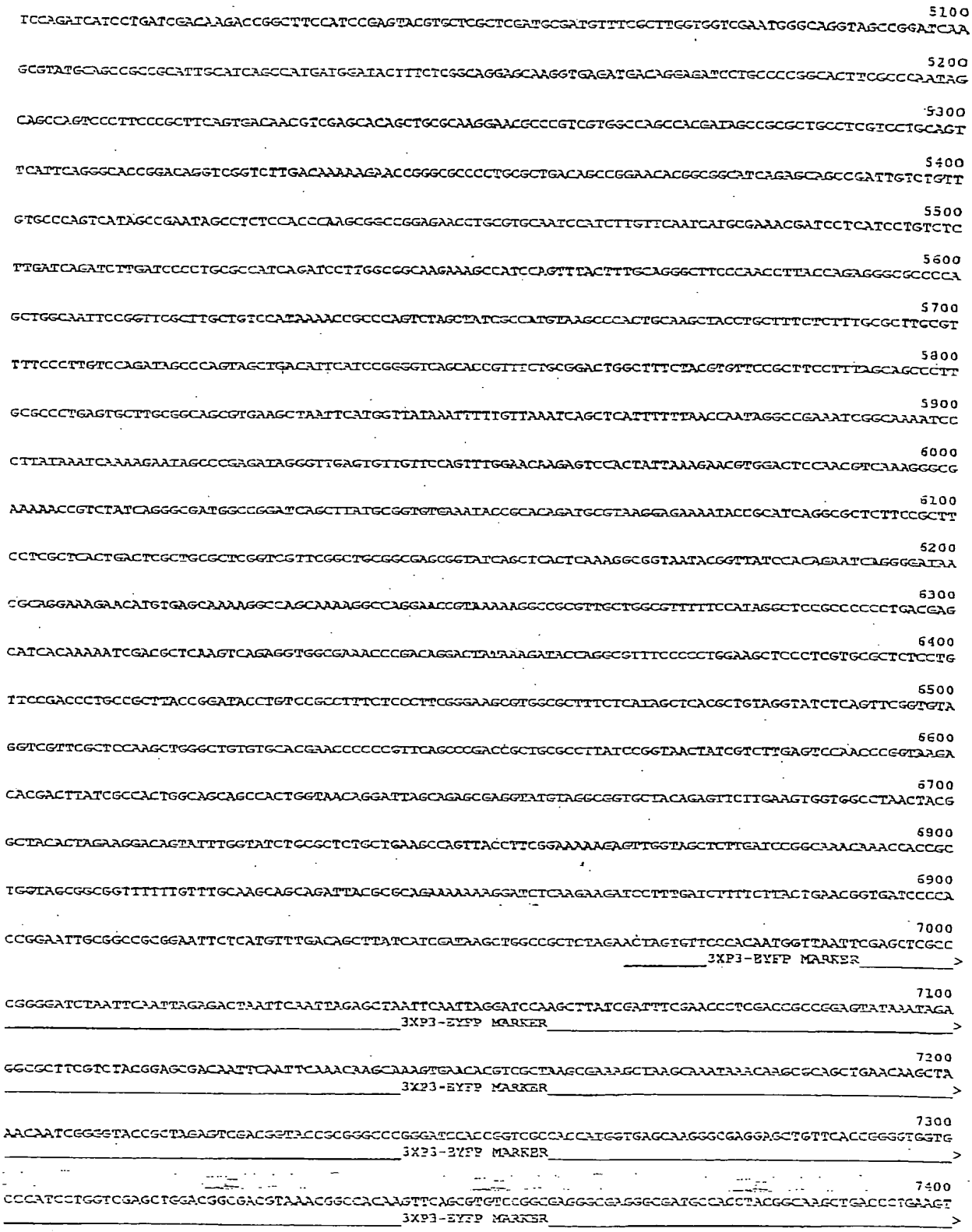
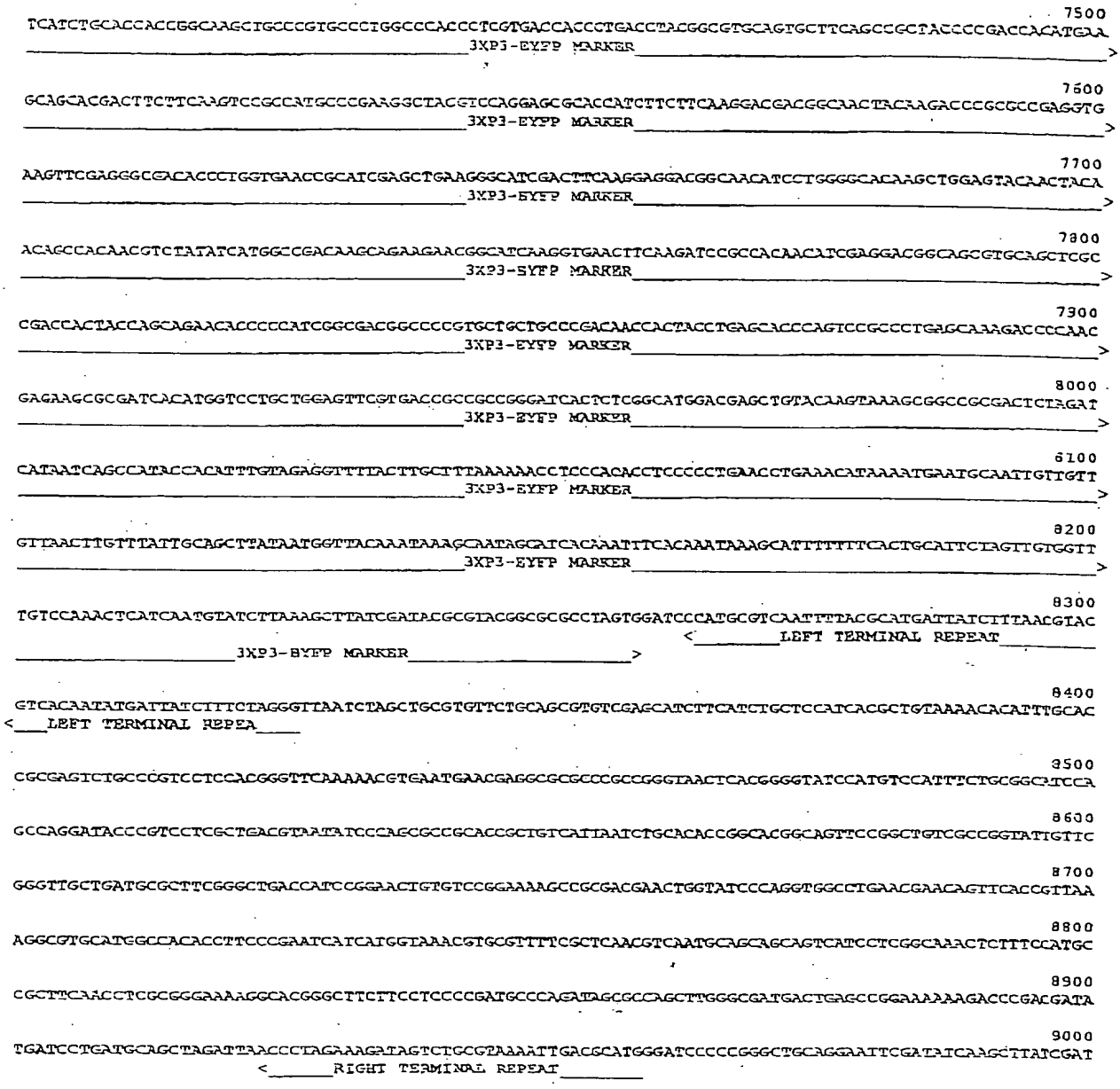

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TCCAGATCATCCTGATCGACAAGACCGGCTTCCATCCGAGTACGTGCTCGCTCGATGCGATGTTTCGCTTGGTGGTCGAATGGGCAGGTAGCCGGATCAA
5200
GCGTATGCAGCCGCCGCATTGCATCAGCCATGATGGATACTTTCTCGGCAGGAGCAAGGTGAGATGACAGGAGATCCTGCCCCGGCACTTCGCCCAATAG
5300
CAGCCAGTCCCTTCCCGCTTCAGTGACAACGTCGAGCACAGCTGCGCAAGGAACGCCCGTCGTGGCCAGCCACGATAGCCGCGCTGCCTCGTCCTGCAGT
5400
TCATTCAGGGCACCGGACAGGTCGGTCTTGACAAAAAGAACCGGGCGCCCCTGCGCTGACAGCCGGAACACGGCGGCATCAGAGCAGCCGATTGTCTGTT
5500
GTGCCCAGTCATAGCCGAATAGCCTCTCCACCCAAGCGGCCGGAGAACCTGCGTGCAATCCATCTTGTTCAATCATGCGAAACGATCCTCATCCTGTCTC
5600
TTGATCAGATCTTGATCCCCTGCGCCATCAGATCCTTGGCGGCAAGAAAGCCATCCAGTTTACTTTGCAGGGCTTCCCAACCTTACCAGAGGGCGCCCCA
5700
GCTGGCAATTCCGGTTCGCTTGCTGTCCATAAAACCGCCCAGTCTAGCTATCGCCATGTAAGCCCACTGCAAGCTACCTGCTTTCTCTTTGCGCTTGCGT
5800
TTTCCCTTGTCCAGATAGCCCAGTAGCTGACATTCATCCGGGGTCAGCACCGTTTCTGCGGACTGGCTTTCTACGTGTTCCGCTTCCTTTAGCAGCCCTT
5900
GCGCCCTGAGTGCTTGCGGCAGCGTGAAGCTAATTCATGGTTATAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCC
6000
CTTATAAATCAAAAGAATAGCCCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCG
6100
AAAAACCGTCTATCAGGGCGATGGCCGGATCAGCTTATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAAATACCGCATCAGGCGCTCTTCCGCTT
6200
CCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAA
6300
CGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAG
6400
CATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTG
6500
TTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTA
6600
GGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGA
6700
CACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACG
6800
GCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGC
6900
TGGTAGCGGCGGTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTTACTGAACGGTGATCCCCA
7000
CCGGAATTGCGGCCGCGGAATTCTCATGTTTGACAGCTTATCATCGATAAGCTGGCCGCTCTAGAACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCC
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7100
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3XP3-EYFP MARKER>
7200
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3XP3-EYFP MARKER>
7300
AACAATCGGGGTACCGCTAGAGTCGACGGTACCGCGGGCCCGGGATCCACCGGTCGCCACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTG
3XP3-EYFP MARKER>
7400
CCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGT
3XP3-EYFP MARKER>

FIG. 14(B)



(SEQ ID NO: 50)

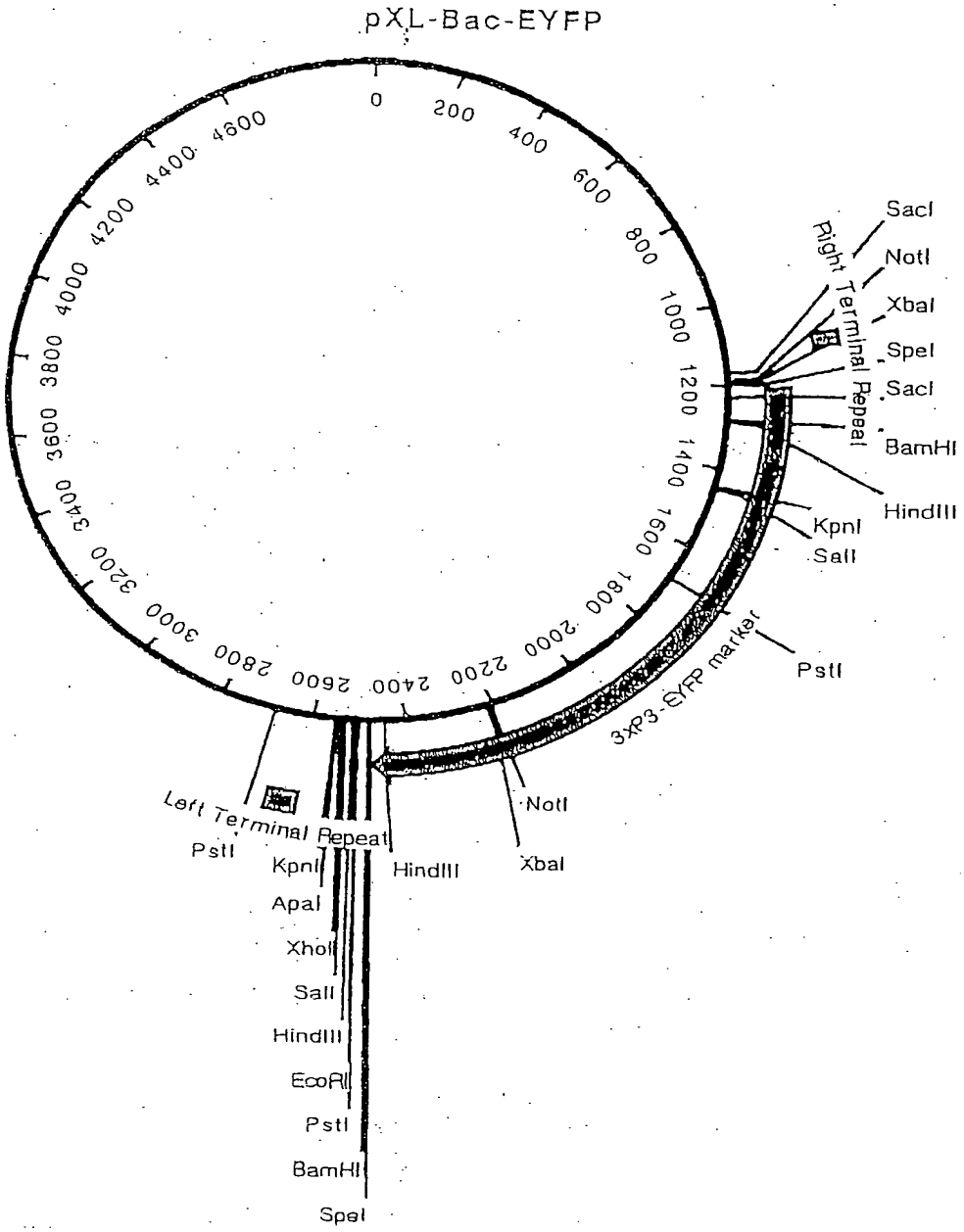

pXL-Bac-EYFP
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
SacI
NotI
XbaI
SpeI
SacI
BamHI
HindIII
KpnI
SalI
PstI
Right Terminal Repeat
3xP3-EYFP marker
NotI
XbaI
HindIII
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
SpeI
Left Terminal Repeat
PstI

FIG. 15 (A)

FIG. 15(B)

pXL-Bac-EYFP

Sequence Range: 1 to 4951

```
                                                                                                    100
CTAAATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT

                                                                                                    200
AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAA

                                                                                                    300
CCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAG

                                                                                                    400
CCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG

                                                                                                    500
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGAT

                                                                                                    600
CGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACGTTG

                                                                                                    700
TAAAACGACGGCCAGTGAGCGCGCCCCGCCGGGTAACTCACGGGGTATCCATGTCCATTTCTGCGGCATCCAGCCAGGATACCCGTCCTCGCTGACGTAAT

                                                                                                    800
ATCCCAGCGCCGCACCGCTGTCATTAATCTGCACACCGGCACGGCAGTTCCGGCTGTCGCCGGTAITGTTCGGGTTGCTGATGCGCTTCGGGCTGACCAT

                                                                                                    900
CCGGAACTGTGTCCGGAAAAGCCGCGACGAACTGGTATCCCAGGTGGCCTGAACGAACAGTTCACCGTTAAAGGCGTGCATGGCCACACCTTCCCGAATC

                                                                                                   1000
ATCATGGTAAACGTGCGTTTTCGCTCAACGTCAATGCAGCAGCAGTCATCCTCGGCAAACTCTTTCCATGCCGCTTCAACCTCGCGGGAAAAGGCACGGG

                                                                                                   1100
CTTCTTCCTCCCCGATGCCCAGATAGCGCCAGCTTGGGCGATGACTGAGCCGGAAAAAAGACCCGACGATATGATCCTGATGCAGCTAGATTAACCCTAG
                                                                                                    <_____

                                                                                                   1200
AAAGATAGTCTGCGTAAAATTGACGCATGATCTAATTAACCCTCACTAAAGGGAACAAAAGCTGGAGCTCCACCGCGGTGGCGGCCGCTCTAGAACTAGT
<___RIGHT TERMINAL REPEAT____

                                                                                                   1300
GTTCCCACAATGGTTAATTCGAGCTCGCCCGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCAATTAGGATCCAAGCTTATCGATTTC
_____3XP3-EYFP MARKER_____>

                                                                                                   1400
GAACCCTCGACCGCCGGAGTATAAATAGAGGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTGAACACGTCGCTAAGCGAAAGCTAAG
_____3XP3-EYFP MARKER_____>

                                                                                                   1500
CAAATAAACAAGCGCAGCTGAACAAGCTAAACAATCGGGGGTACCGCTAGAGTCGACGGTACGATCCACCGGTCGCCACCATGGTGAGCAAGGGCGAGGAG
_____3XP3-EYFP MARKER_____>

                                                                                                   1600
CTGTTCACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACG
_____3XP3-EYFP MARKER_____>

                                                                                                   1700
GCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCTTCGGCTACGGCCTGCAGTGCTTCGCCCG
_____3XP3-EYFP MARKER_____>

                                                                                                   1800
CTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTAC
_____3XP3-EYFP MARKER_____>

                                                                                                   1900
AAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACA
_____3XP3-EYFP MARKER_____>

                                                                                                   2000
AGCTGGAGTACAACTACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACTTCAAGATCCGCCACAACATCGAGGA
_____3XP3-EYFP MARKER_____>

                                                                                                   2100
CGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAACCACTACCTGAGCTACCAGTCCGCC
_____3XP3-EYFP MARKER_____>
```

FIG 15(B) cont.

4300
CAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCT
AMPICILLIN RESISTANCE >

4400
CGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCC
AMPICILLIN RESISTANCE >

4500
TCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTT
AMPICILLIN RESISTANCE >

4600
TCTGTGAGTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCAC
AMPICILLIN RESISTANCE >

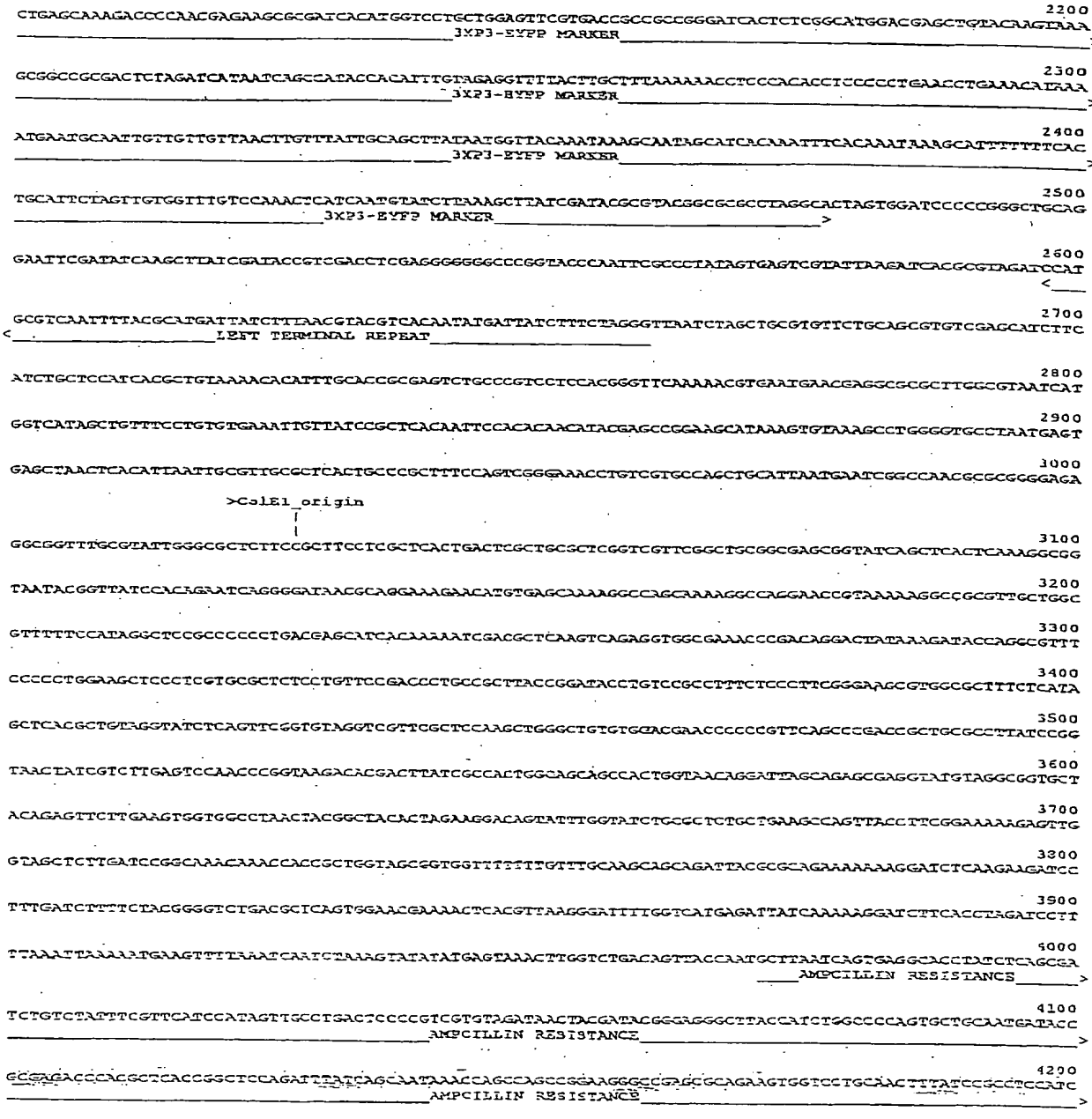
4700
ATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCAC
AMPICILLIN RESISTANCE >

4800
TCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCG
AMPICILLIN RESISTANCE >

4900
ACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTT
AMPICILLIN RESISTANCE >

AGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 51)

FIG. 15(B) cont.


2200
3XP3-EYFP MARKER
2300
3XP3-EYFP MARKER
2400
3XP3-EYFP MARKER
2500
3XP3-EYFP MARKER
2600
2700
LEFT TERMINAL REPEAT
2800
2900
3000
>ColE1_origin
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
AMPCILLIN RESISTANCE
4100
AMPCILLIN RESISTANCE
4200
AMPCILLIN RESISTANCE

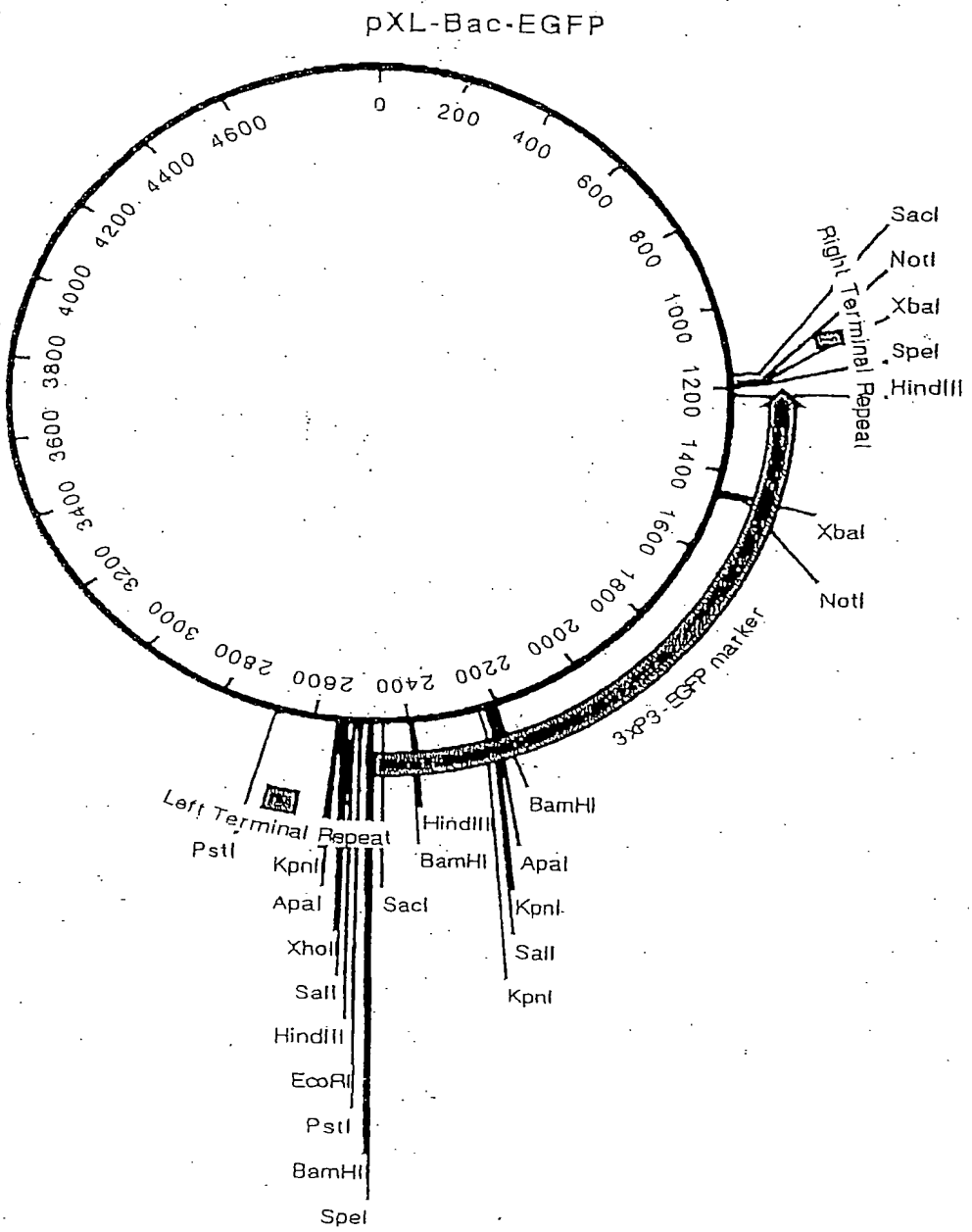

pXL-Bac-EGFP
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
SacI
NotI
XbaI
SpeI
HindIII
Right Terminal Repeat
XbaI
NotI
3xP3-EGFP marker
BamHI
ApaI
KpnI
SalI
KpnI
HindIII
BamHI
SacI
Left Terminal Repeat
PstI
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
SpeI

FIG. 16 (A)

FIG. 16(B)

pXL-Bac-EGFP

Sequence Range: 1 to 4952

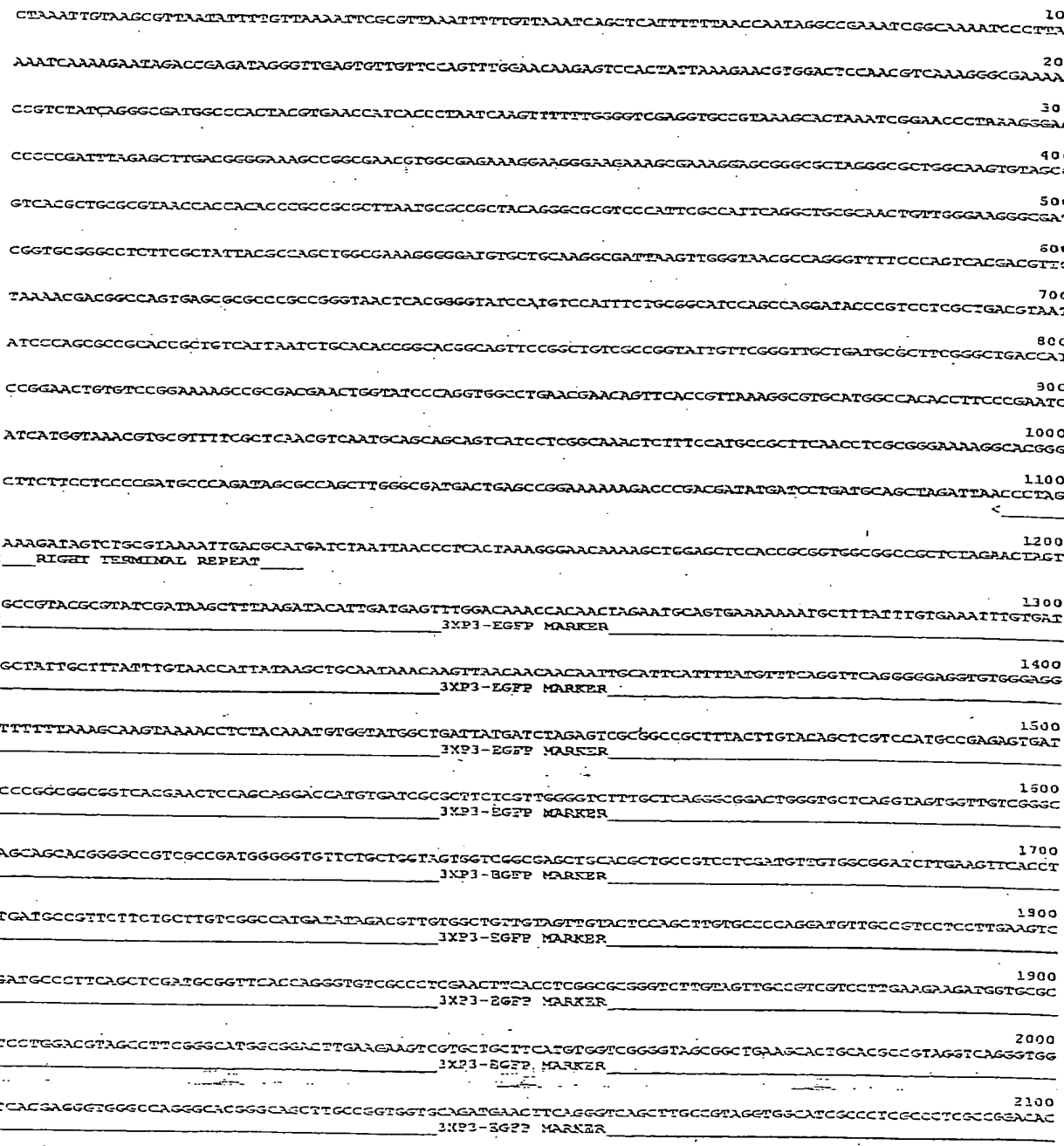


FIG. 16(B) cont.

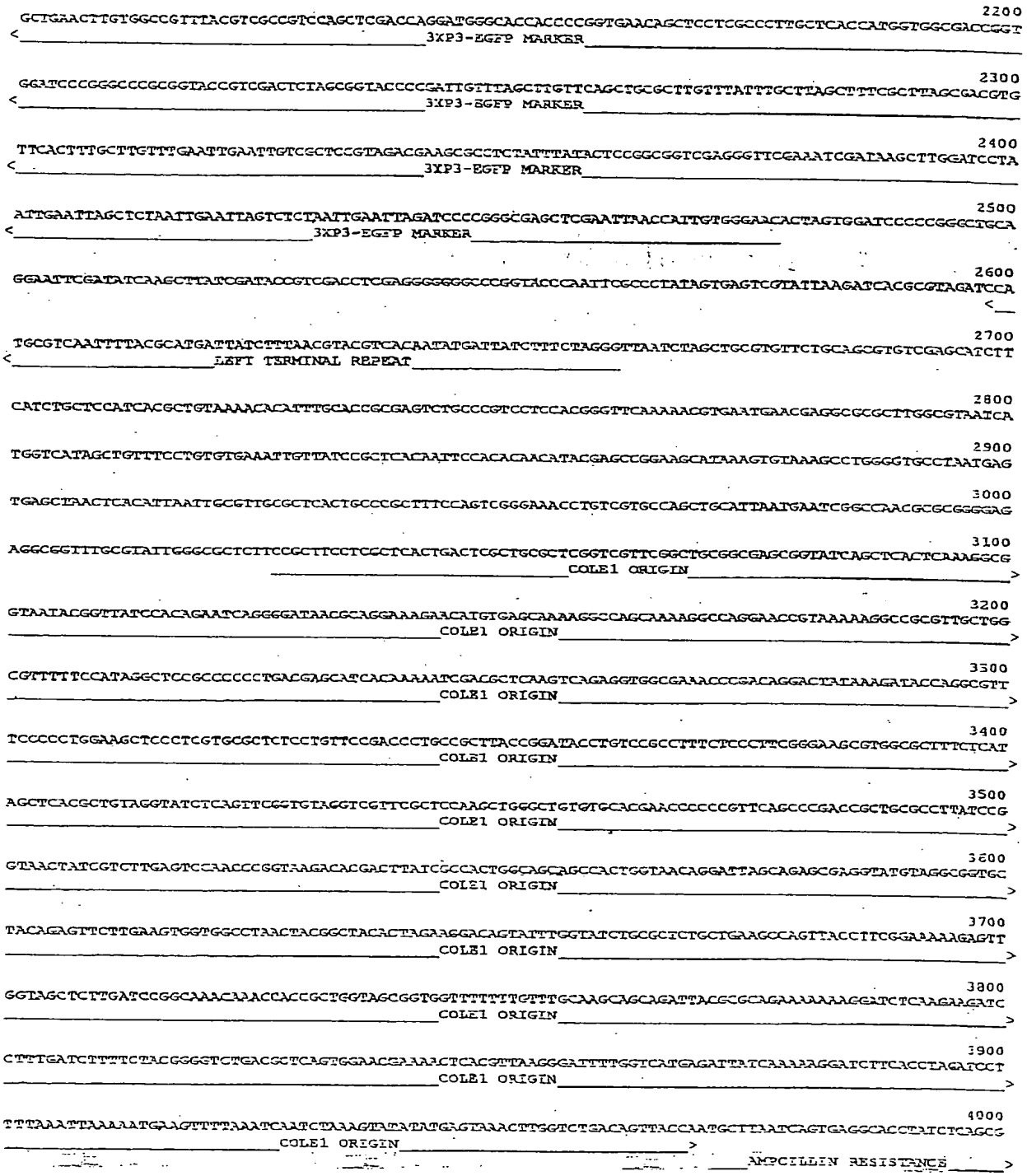

2200
GCTGAACTTGTGGCCGTTTACGTCGCCGTCCAGCTCGACCAGGATGGGCACCACCCCGGTGAACAGCTCCTCGCCCTTGCTCACCATGGTGGCGACCGGT
3XP3-EGFP MARKER
2300
GGATCCCCGGGCCCGCGGTACCGTCGACTCTAGCGGTACCCCGATTGTTTAGCTTGTTCAGCTGCGCTTGTTTATTTGCTTAGCTTTCGCTTAGCGACGTG
3XP3-EGFP MARKER
2400
TTCACTTTGCTTGTTTGAATTGAATTGTCGCTCCGTAGACGAAGCGCCTCTATTTATACTCCGGCGGTCGAGGGTTCGAAATCGATAAGCTTGGATCCTA
3XP3-EGFP MARKER
2500
ATTGAATTAGCTCTAATTGAATTAGTCTCTAATTGAATTAGATCCCCGGGCGAGCTCGAATTAACCATTGTGGGAACACTAGTGGATCCCCCGGGCTGCA
3XP3-EGFP MARKER
2600
GGAATTCGATATCAAGCTTATCGATACCGTCGACCTCGAGGGGGGGCCCGGTACCCAATTCGCCCTATAGTGAGTCGTATTAAGATCACGCGTAGATCCA
2700
TGCGTCAATTTTACGCATGATTATCTTTAACGTACGTCACAATATGATTATCTTTCTAGGGTTAATCTAGCTGCGTGTTCTGCAGCGTGTCGAGCATCTT
LEFT TERMINAL REPEAT
2800
CATCTGCTCCATCACGCTGTAAAACACATTTGCACCGCGAGTCTGCCCGTCCTCCACGGGTTCAAAAACGTGAATGAACGAGGCGCGCTTGGCGTAATCA
2900
TGGTCATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAG
3000
TGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAG
3100
AGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCG
COLE1 ORIGIN
3200
GTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGG
COLE1 ORIGIN
3300
CGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTT
COLE1 ORIGIN
3400
TCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCAT
COLE1 ORIGIN
3500
AGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCG
COLE1 ORIGIN
3600
GTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGC
COLE1 ORIGIN
3700
TACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTT
COLE1 ORIGIN
3800
GGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATC
COLE1 ORIGIN
3900
CTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCT
COLE1 ORIGIN
4000
TTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCG
COLE1 ORIGIN
AMPICILLIN RESISTANCE

FIG. 16(B) cont

4100
ATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATAC
AMPICILLIN RESISTANCE

4200
CGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCAT
AMPICILLIN RESISTANCE

4300
CCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGC
AMPICILLIN RESISTANCE

4400
TCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTC
AMPICILLIN RESISTANCE

4500
CTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTT
AMPICILLIN RESISTANCE

4600
TTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCA
AMPICILLIN RESISTANCE

4700
CATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCA
AMPICILLIN RESISTANCE

4800
CTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGC
AMPICILLIN RESISTANCE

4900
GACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATT
AMPICILLIN RESISTANCE

TAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 52)

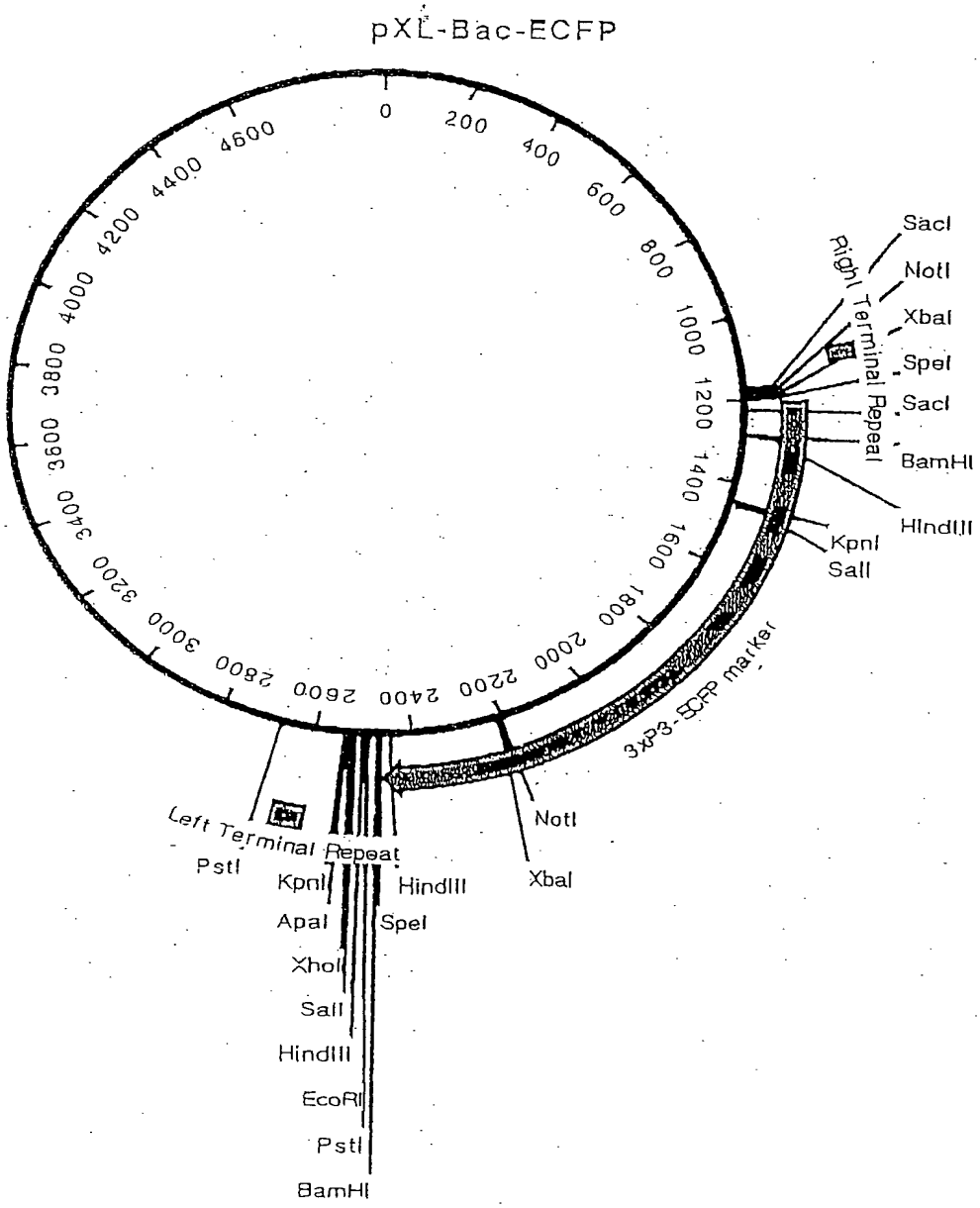

pXL-Bac-ECFP
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
SacI
NotI
XbaI
SpeI
SacI
BamHI
HindIII
KpnI
SalI
Right Terminal Repeat
3xP3-ECFP marker
NotI
XbaI
Left Terminal Repeat
PstI
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
HindIII
SpeI

FIG. 17(A)

FIG. 17(B)

pXL-Bac-ECFP

Sequence Range: 1 to 4941

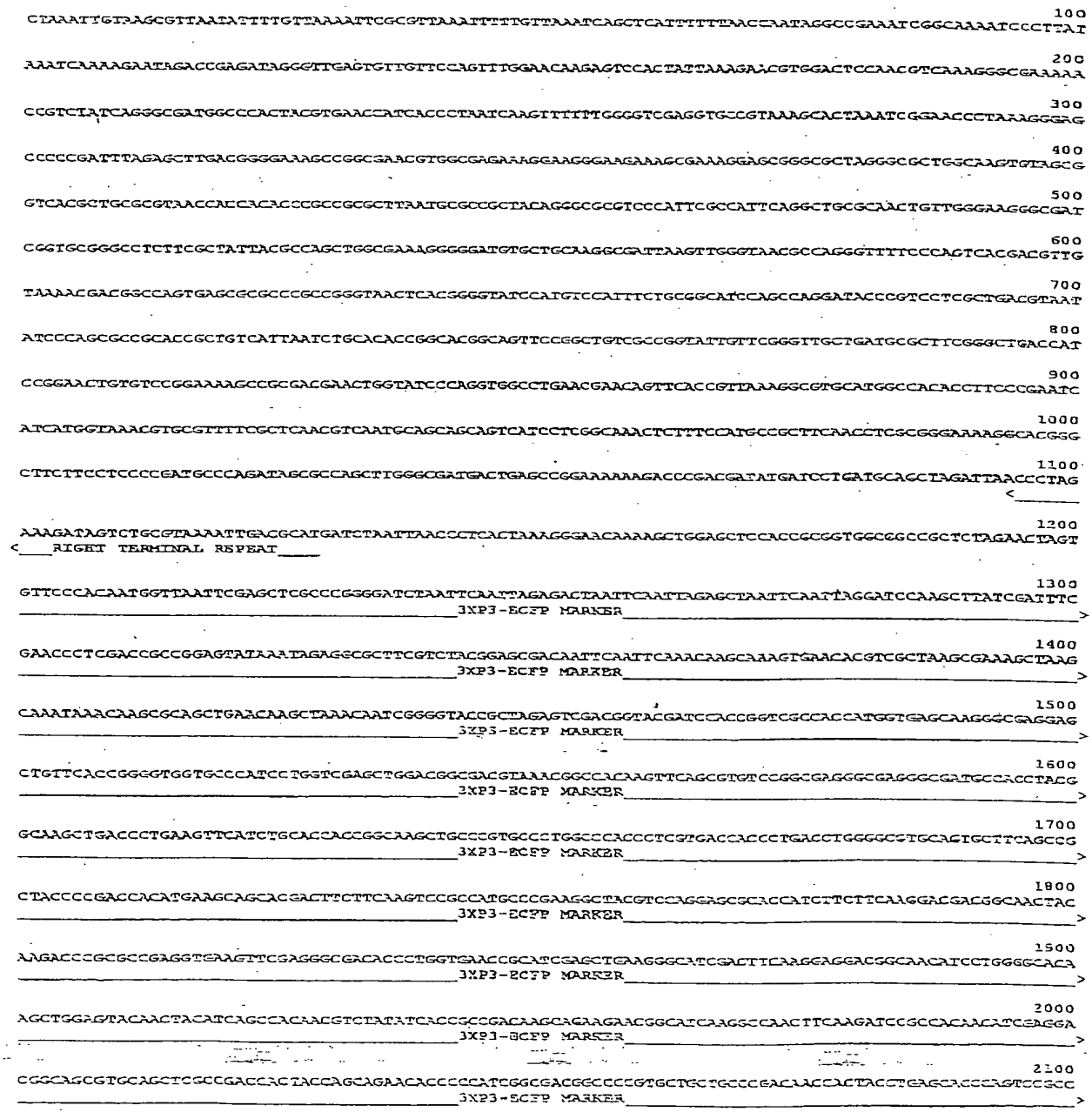


FIG. 17(B) cont.

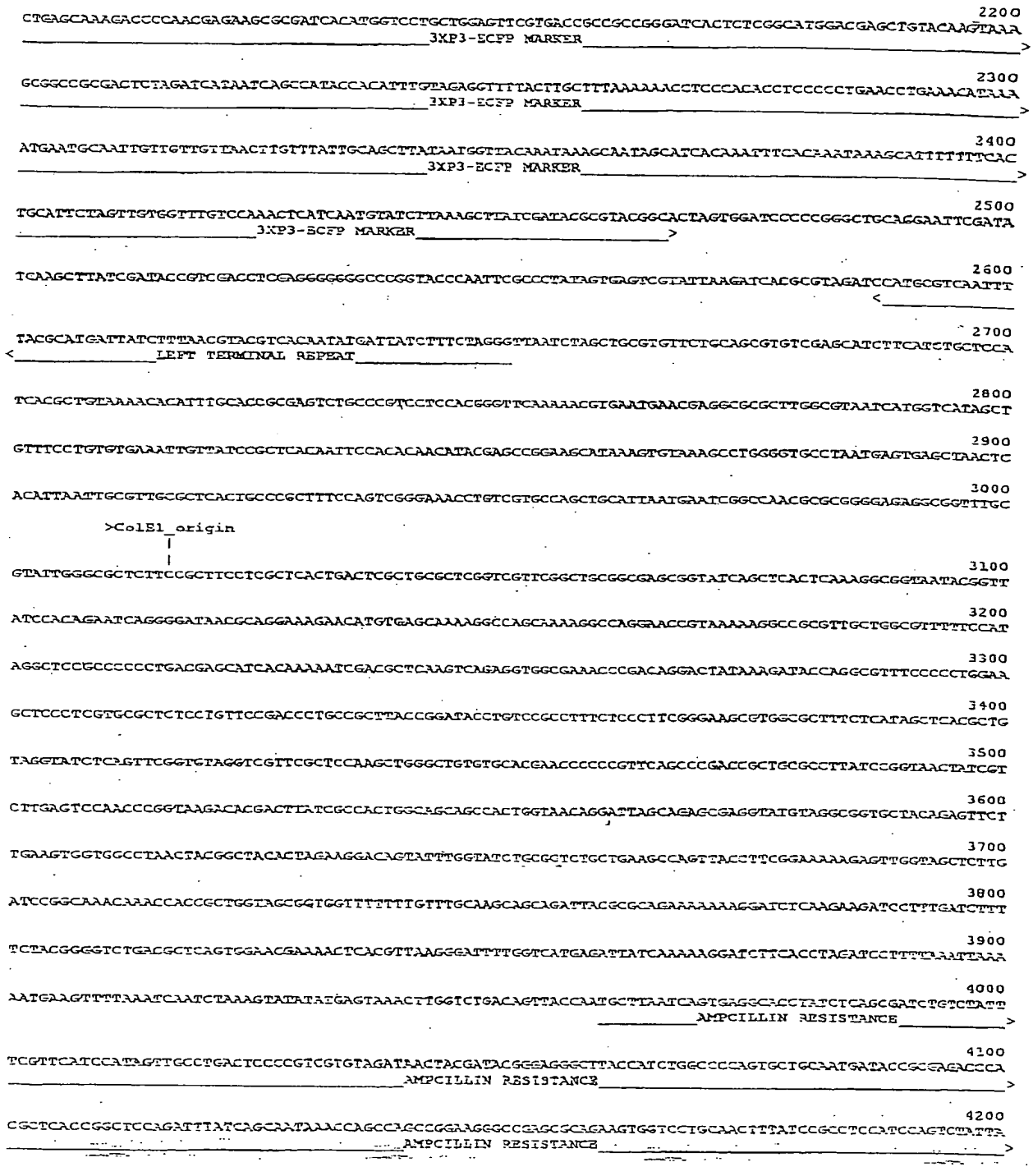

2200
3XP3-ECFP MARKER
2300
3XP3-ECFP MARKER
2400
3XP3-ECFP MARKER
2500
3XP3-ECFP MARKER
2600
2700
LEFT TERMINAL REPEAT
2800
2900
3000
>ColE1_origin
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
AMPCILLIN RESISTANCE
4100
AMPCILLIN RESISTANCE
4200
AMPCILLIN RESISTANCE

FIG. 17(B) cont.

4300
ATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGG
AMPCILLIN RESISTANCE

4400
TATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTT
AMPCILLIN RESISTANCE

4500
GTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTG
AMPCILLIN RESISTANCE

4600
GTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAAC
AMPCILLIN RESISTANCE

4700
TTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCC
AMPCILLIN RESISTANCE

4800
AACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGAAAT
AMPCILLIN RESISTANCE

4900
GTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAA
AMPCILLIN R

ACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCAC (SEQ ID NO: 53)

pBS-ITR-ECFP

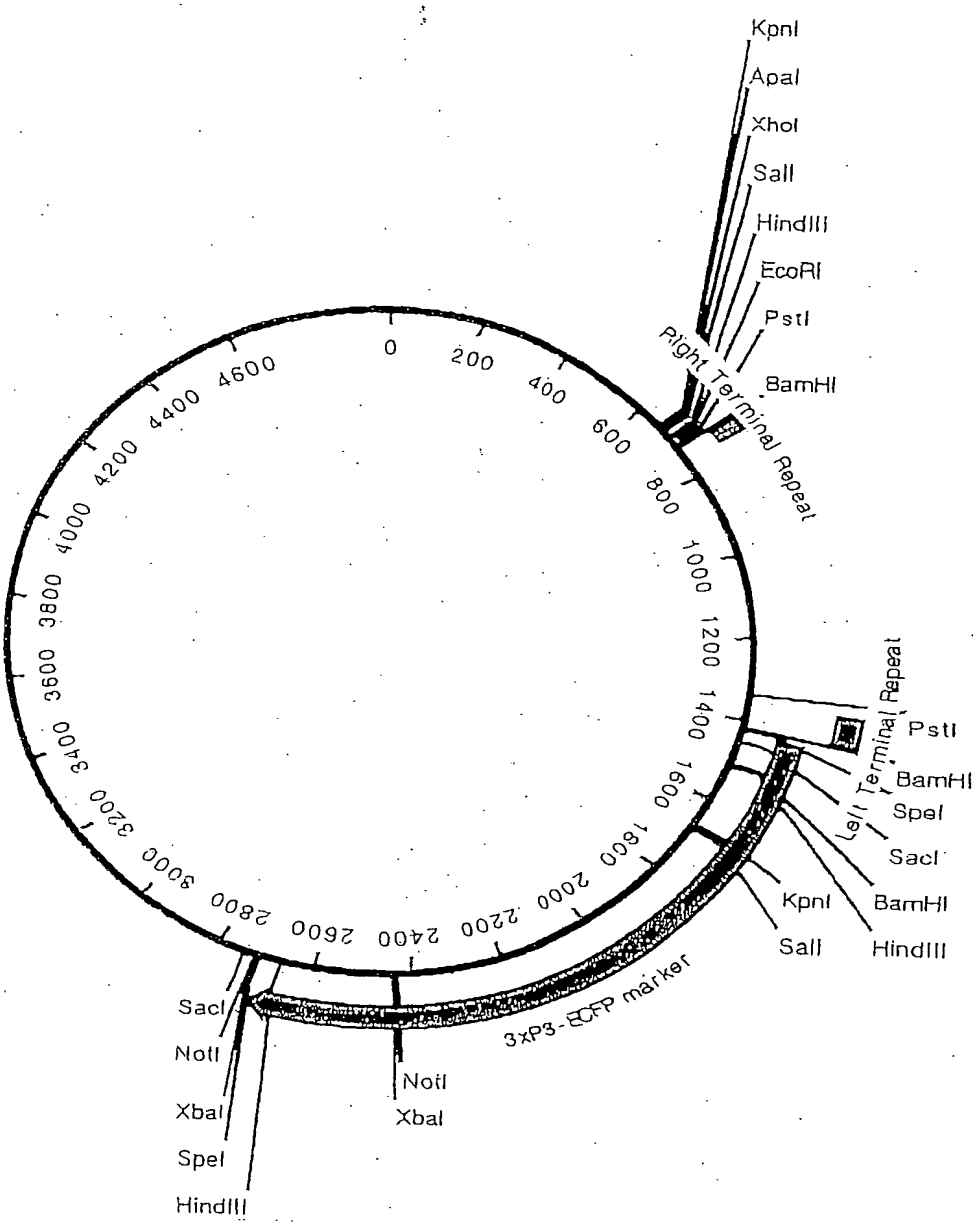


FIG. 18(A)

PBS-ITR-ECFP

FIG. 18(B)

Sequence Range: 1 to 4943

```
                                                                    100
CACCTGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTT

                                                                    200
CGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTACGGCAC

                                                                    300
CTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTA

                                                                    400
ATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAA

                                                                    500
AAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGCTTACAATTTCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGC

                                                                    600
GATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACG

                                                                    700
TTGTAAAACGACGGCCAGTGAATTGTAATACGACTCACTATAGGGCGAATTGGGTACCGGGCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTGATATC

                                                                    800
GAATTCCTGCAGCCCGGGGGATCCCATGCGTCAATTTTACGCAGACTATCTTTCTAGGGTTAATCTAGCTGCATCAGGATCATATCGTCGGGTCTTTTTT
                                  _____RIGHT TERMINAL REPEAT_____>

                                                                    900
CCGGCTCAGTCATCGCCCAAGCTGGCGCTATCTGGGCATCGGGGAGGAAGAAGCCCGTGCCTTTTCCCGCGAGGTTGAAGCGGCATGGAAAGAGTTTGCC

                                                                   1000
GAGGATGACTGCTGCTGCATTGACGTTGAGCGAAAACGCACGTTTACCATGATGATTCGGGAAGGTGTGGCCATGCACGCCTTTAACGGTGAACTGTTCG

                                                                   1100
TTCAGGCCACCTGGGATACCAGTTCGTCGCGGCTTTTCCGGACACAGTTCCGGATGGTCAGCCCGAAGCGCATCAGCAACCCGAACAATACCGGCGACAG

                                                                   1200
CCGGAACTGCCGTGCCGGTGTGCAGATTAATGACAGCGGTGCGGCCTGGGATATTACGTCAGCGAGGACGGGTATCCTGGCTGGATGCCGCAGAAATGG

                                                                   1300
ACATGGATACCCCGTGAGTTACCCGGCGGCTCGTTCATTCACGTTTTTGAACCCGTGGAGGACGGGCAGACTCGCGGTGCAAATGTGTTTTACAGCGTGA

                                                                   1400
TGGAGCAGATGAAGATGCTCGACACGCTGCAGAACACGCAGCTAGATTAACCCTAGAAAGATAATCATATTGTGACGTACGTTAAAGATAATCATGCGTA
                                                  _____LEFT TERMINAL REPEAT_____>

                                                                   1500
AAATTGACGCATGGGATCCACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCCCGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCA
_____>
                                  _____3XP3-ECFP MARKER_____>

                                                                   1600
ATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGTATAAATAGAGGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTG
_____3XP3-ECFP MARKER_____>

                                                                   1700
AACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGCTAAACAATCGGGGTACCGCTAGAGTCGACGGTACGATCCACCGGTCGC
_____3XP3-ECFP MARKER_____>

                                                                   1800
CACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGC
_____3XP3-ECFP MARKER_____>

                                                                   1900
GAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCCTGA
_____3XP3-ECFP MARKER_____>

                                                                   2000
CCTGGGGCGTGCAGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCAT
_____3XP3-ECFP MARKER_____>

                                                                   2100
CTTCTTCAAGGACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAG
_____3XP3-ECFP MARKER_____>
```

FIG. 18(B) cont.

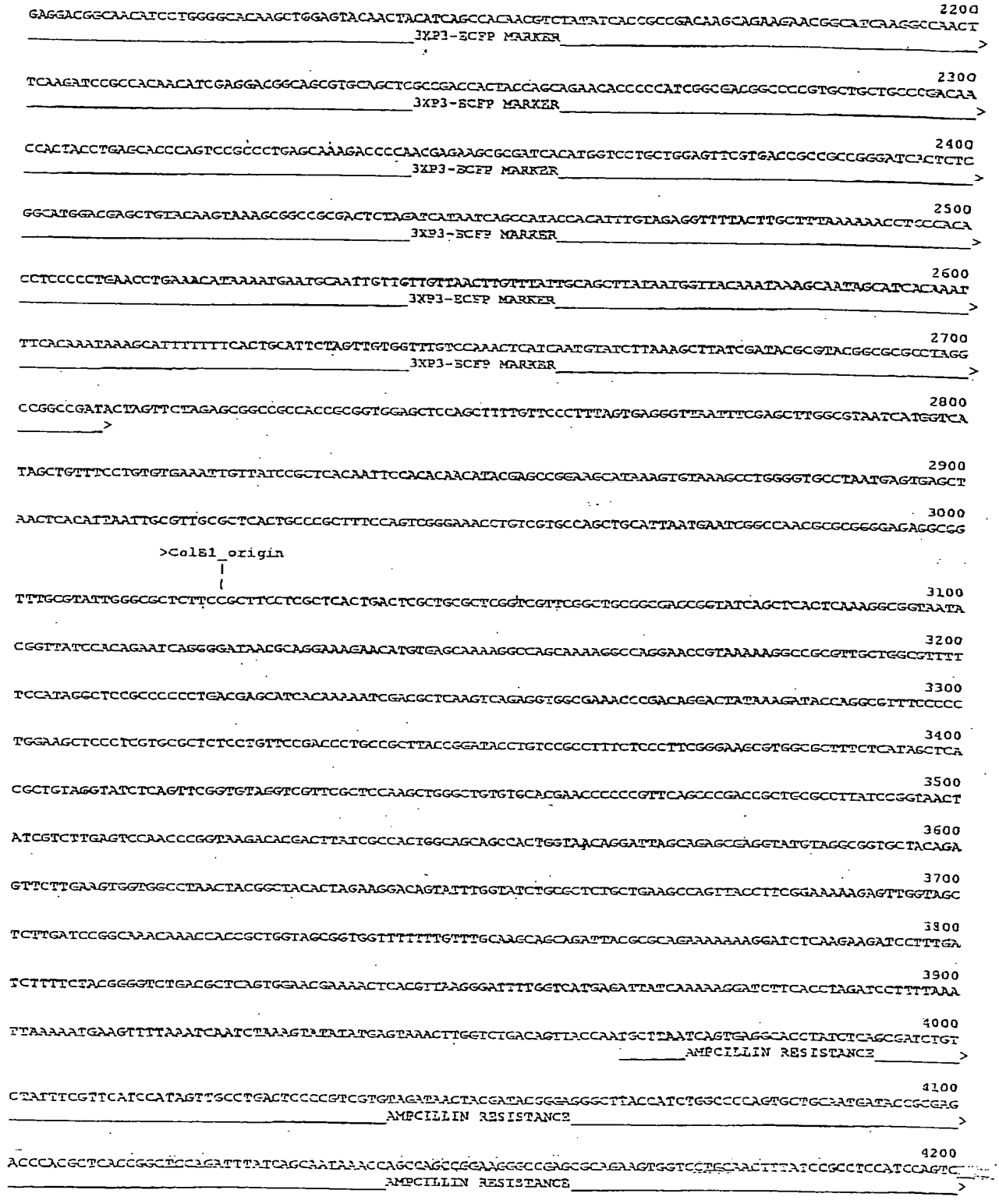

2200
3XP3-ECFP MARKER
2300
3XP3-ECFP MARKER
2400
3XP3-ECFP MARKER
2500
3XP3-ECFP MARKER
2600
3XP3-ECFP MARKER
2700
3XP3-ECFP MARKER
2800
2900
3000
>ColE1_origin
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
AMPCILLIN RESISTANCE
4100
AMPCILLIN RESISTANCE
4200
AMPCILLIN RESISTANCE

FIG. 18(B) cont.

4300
TATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCG
AMPCILLIN RESISTANCE >

4400
TTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGA
AMPCILLIN RESISTANCE >

4500
TCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGT
AMPCILLIN RESISTANCE >

4600
GACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGC
AMPCILLIN RESISTANCE >

4700
AGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTG
AMPCILLIN RESISTANCE >

4800
CACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACG
AMPCILLIN RESISTANCE >

4900
GAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAA
AMPCILLIN RESISTANCE >

AATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGC (SEQ ID NO: 54)

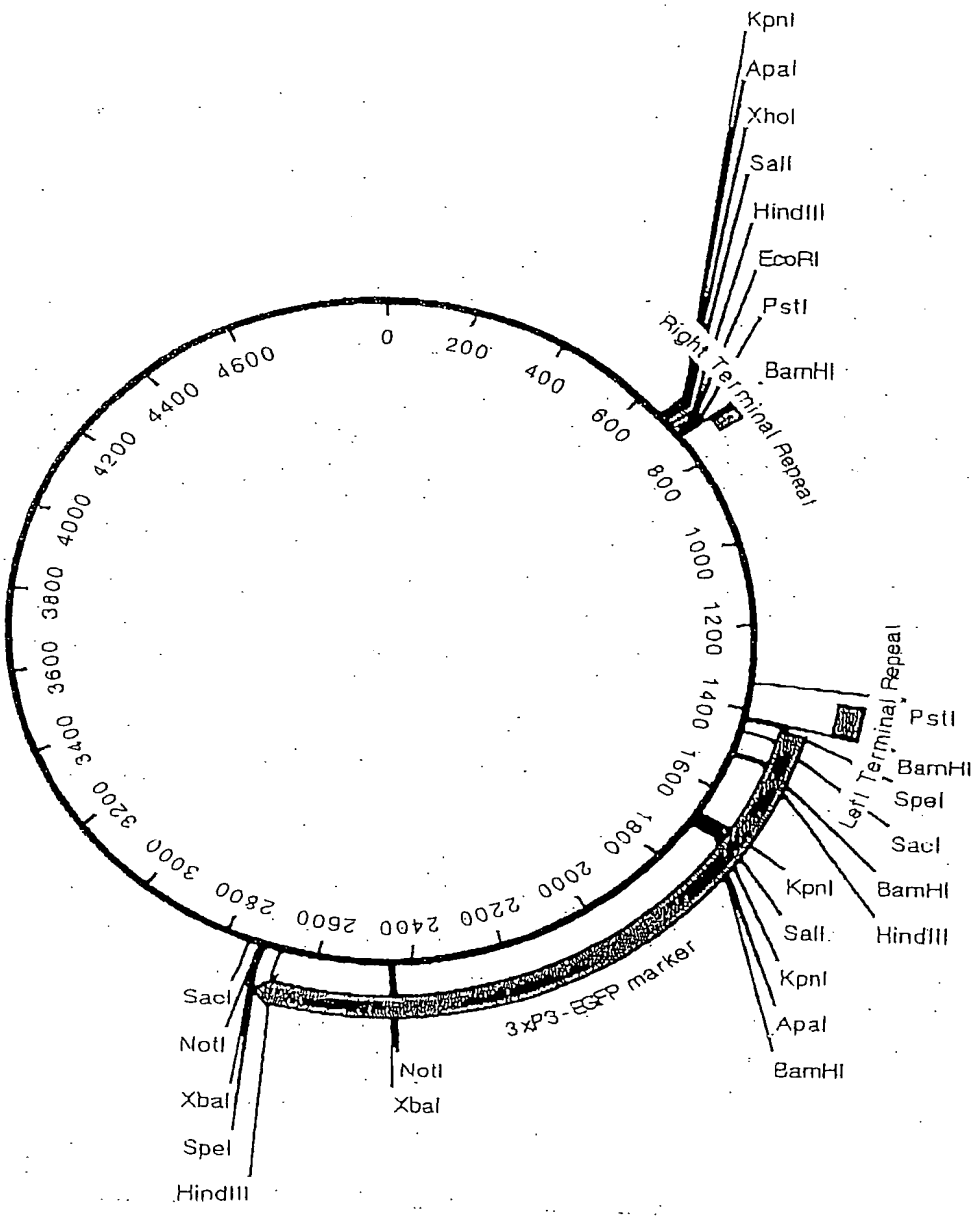

pBS-ITR-EGFP
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
Right Terminal Repeat
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
PstI
BamHI
SpeI
SacI
KpnI
BamHI
HindIII
Left Terminal Repeat
SalI
KpnI
ApaI
BamHI
3xP3-EGFP marker
SacI
NotI
XbaI
SpeI
HindIII
NotI
XbaI

FIG. 19(A)

FIG. 19(B)

pBS-ITR-EGFP

Sequence Range: 1 to 4944

```
                                                                                                    100
CACCTGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTT

                                                                                                    200
CGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTACGGCAC

                                                                                                    300
CTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTA

                                                                                                    400
ATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAA

                                                                                                    500
AAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGCTTACAATTTCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGC

                                                                                                    600
GATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACG

                                                                                                    700
TTGTAAAACGACGGCCAGTGAATTGTAATACGACTCACTATAGGGCGAATTGGGTACCGGGCCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTGATATC

                                                                                                    800
GAATTCCTGCAGCCCGGGGGATCCCATGCGTCAATTTTACGCAGACTATCTTTCTAGGGTTAATCTAGCTGCATCAGGATCATATCGTCGGGTCTTTTTT
                                  _____RIGHT TERMINAL REPEAT_____>

                                                                                                    900
CCGGCTCAGTCATCGCCCAAGCTGGCGCTATCTGGGCATCGGGGAGGAAGAAGCCCGTGCCTTTTCCCGCGAGGTTGAAGCGGCATGGAAAGAGTTTGCC

                                                                                                   1000
GAGGATGACTGCTGCTGCATTGACGTTGAGCGAAAACGCACGTTTACCATGATGATTCGGGAAGGTGTGGCCATGCACGCCTTTAACGGTGAACTGTTCG

                                                                                                   1100
TTCAGGCCACCTGGGATACCAGTTCGTCGCGGCTTTTCCGGACACAGTTCCGGATGGTCAGCCCGAAGCGCATCAGCAACCCGAACAATACCGGCGACAG

                                                                                                   1200
CCGGAACTGCCGTGCCGGTGTGCAGATTAATGACAGCGGTGCGGCGCTGGGATATTACGTCAGCGAGGACGGGTATCCTGGCTGGATGCCGCAGAAATGG

                                                                                                   1300
ACATGGATACCCCGTGAGTTACCCGGCGGCTCGTTCATTCACGTTTTTGAACCGTGGAGGACGGGCAGACTCGCGGTGCAAATGTGTTTTACAGCGTGA

                                                                                                   1400
TGGAGCAGATGAAGATGCTCGACACGCTGCAGAACACGCAGCTAGATTAACCCTAGAAAGATAATCATATTGTGACGTACGTTAAAGATAATCATGCGTA
                                                                  _____LEFT TERMINAL REPEAT_____>

                                                                                                   1500
AAATTGACGCATGGGATCCACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCCCGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCA
_____>
                          _____3XP3-EGFP MARKER_____>

                                                                                                   1600
ATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGTATAAATAGAGGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTG
_____3XP3-EGFP MARKER_____>

                                                                                                   1700
AACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGCTAAACAATCGGGGGTACCGCTAGAGTCGACGGTACCGCGGGCCCGGGAT
_____3XP3-EGFP MARKER_____>

                                                                                                   1800
CCACCGGTCGCCACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCA
_____3XP3-EGFP MARKER_____>

                                                                                                   1900
GCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGT
_____3XP3-EGFP MARKER_____>

                                                                                                   2000
GACCACCCTGACCTACGGCGTGCAGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCCCGAAGGCTACGTCCAG
_____3XP3-EGFP MARKER_____>

                                                                                                   2100
GAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCA
_____3XP3-EGFP MARKER_____>
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FIG. 19(B) cont.

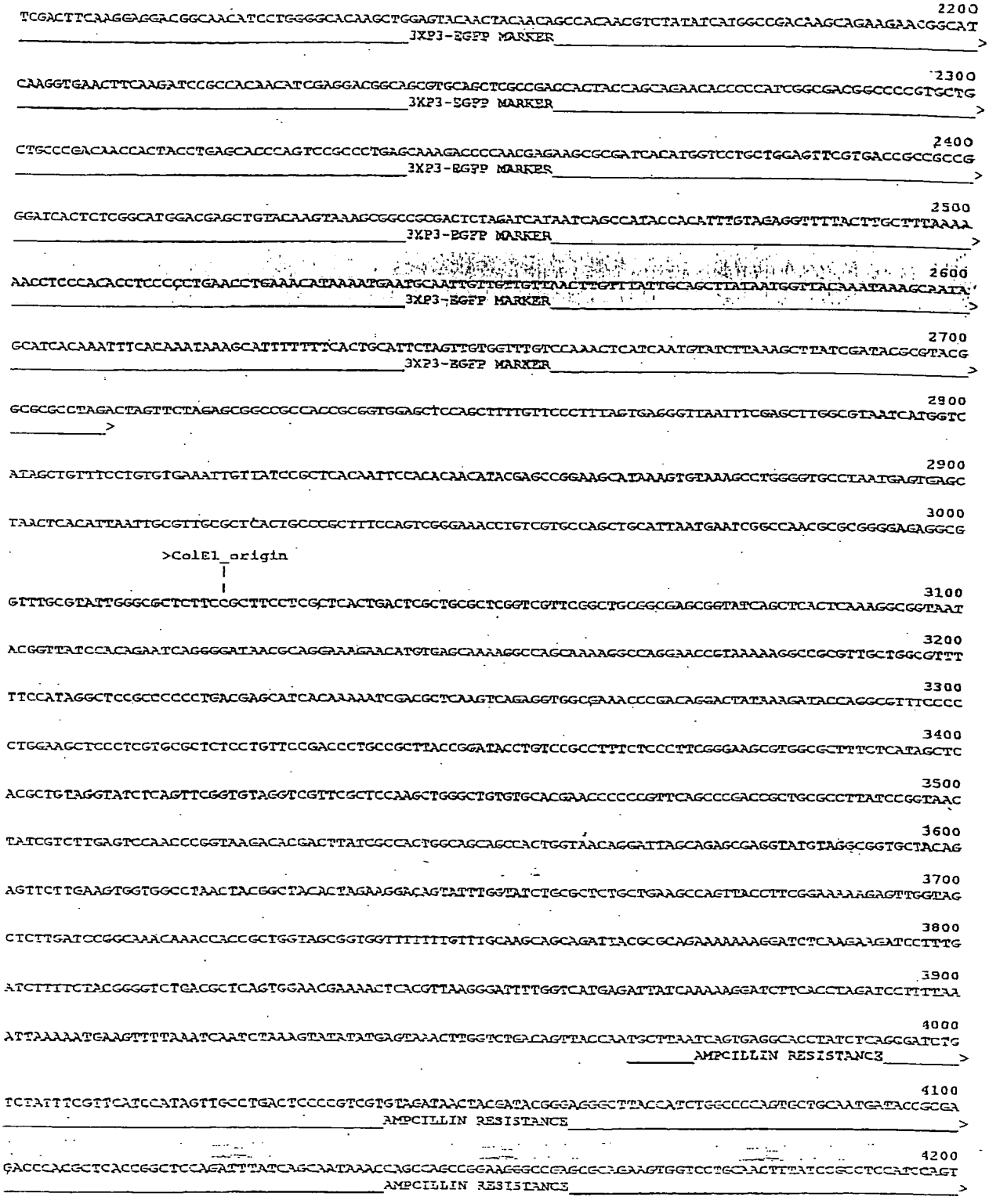

2200
TCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACTACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCAT
3XP3-EGFP MARKER
2300
CAAGGTGAACTTCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCCATCGGCGACGGCCCCGTGCTG
3XP3-EGFP MARKER
2400
CTGCCCGACAACCACTACCTGAGCACCCAGTCCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCCTGCTGGAGTTCGTGACCGCCGCCG
3XP3-EGFP MARKER
2500
GGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCGACTCTAGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAA
3XP3-EGFP MARKER
2600
AACCTCCCACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATA
3XP3-EGFP MARKER
2700
GCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTAAAGCTTATCGATACGCGTACG
3XP3-EGFP MARKER
2800
GCGCGCCTAGACTAGTTCTAGAGCGGCCGCCACCGCGGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGGTTAATTTCGAGCTTGGCGTAATCATGGTC
2900
ATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAGTGAGC
3000
TAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCG
>ColE1_origin
3100
GTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAAT
3200
ACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTT
3300
TTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCC
3400
CTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTC
3500
ACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAAC
3600
TATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAG
3700
AGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAG
3800
CTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTG
3900
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4000
ATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTG
AMPCILLIN RESISTANCE
4100
TCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGA
AMPCILLIN RESISTANCE
4200
GACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGT
AMPCILLIN RESISTANCE

FIG. 19(B) cont.

4300
CTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTC
AMPCILLIN RESISTANCE>

4400
GTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCG
AMPCILLIN RESISTANCE>

4500
ATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTG
AMPCILLIN RESISTANCE>

4600
TGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAG
AMPCILLIN RESISTANCE>

4700
CAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT
AMPCILLIN RESISTANCE>

4800
GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACAC
AMPCILLIN RESISTANCE>

4900
GGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAA
AMPCILLIN RESISTANCE>

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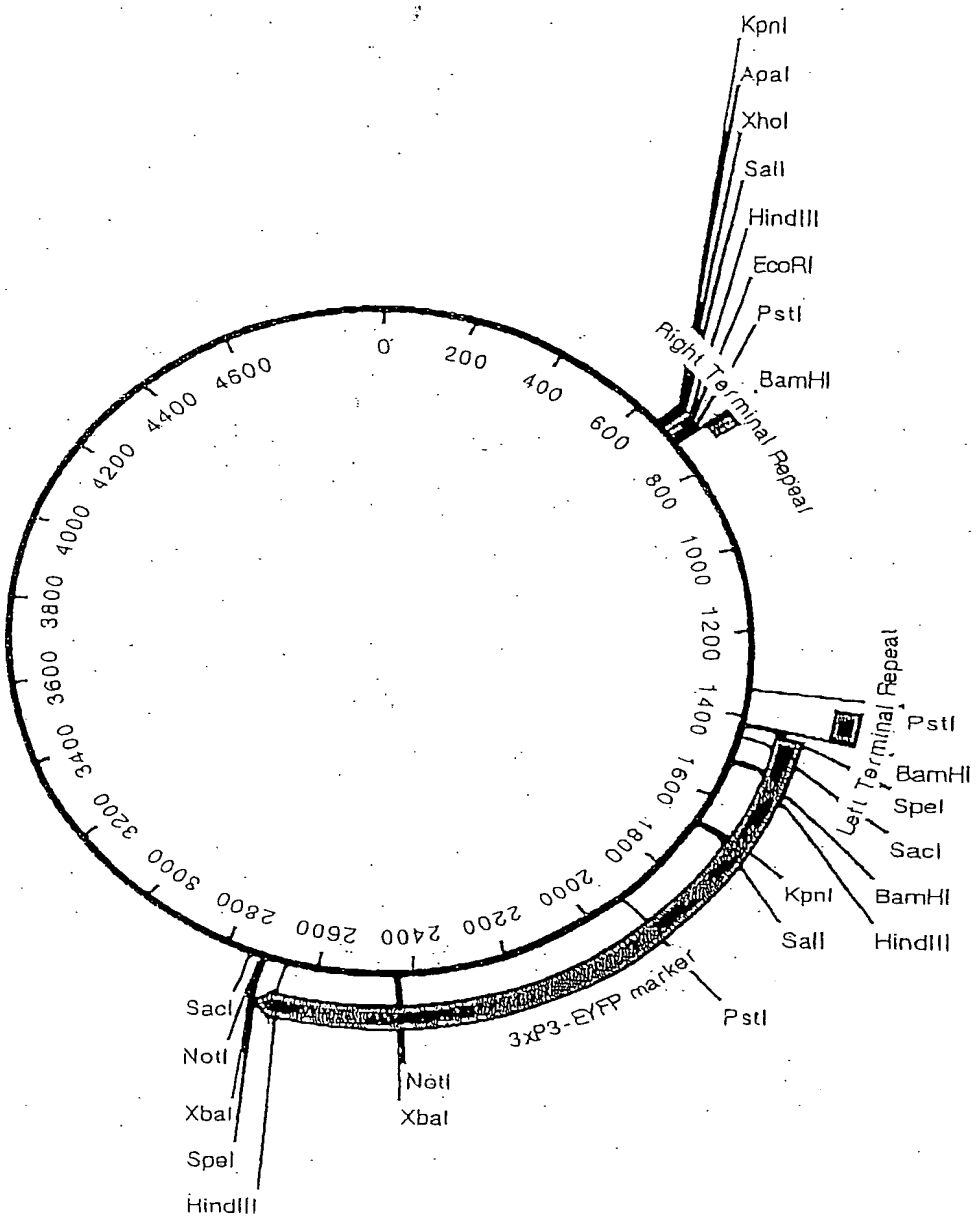

pBS-ITR-EYFP
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
PstI
BamHI
Right Terminal Repeat
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
PstI
BamHI
SpeI
SacI
KpnI
BamHI
SalI
HindIII
Left Terminal Repeat
3xP3-EYFP marker
PstI
SacI
NotI
XbaI
SpeI
HindIII
NotI
XbaI

FIG. 20 (A)

FIG. 20(B)

pBS-ITR-EYFP

Sequence Range: 1 to 4944

```
                                                                      100
CACCTGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTT

                                                                      200
CGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTACGGCAC

                                                                      300
CTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTA

                                                                      400
ATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAA

                                                                      500
AAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGCTTACAATTTCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGC

                                                                      600
GATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACG

                                                                      700
TTGTAAAACGACGGCCAGTGAATTGTAATACGACTCACTATAGGGCGAATTGGGTACCGGGCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTGATATC

                                                                      800
GAATTCCTGCAGCCCGGGGGATCCCATGCGTCAATTTTACGCAGACTATCTTTCTAGGGTTAATCTAGCTGCATCAGGATCATATCGTCGGGTCTTTTTT
                              _____RIGHT TERMINAL REPEAT_____>

                                                                      900
CCGGCTCAGTCATCGCCCAAGCTGGCGCTATCTGGGCATCGGGGAGGAAGAAGCCCGTGCCTTTTCCCGCGAGGTTGAAGCGGCATGGAAAGAGTTTGCC

                                                                     1000
GAGGATGACTGCTGCTGCATTGACGTTGAGCGAAAACGCACGTTTACCATGATGATTCGGGAAGGTGTGGCCATGCACGCCTTTAACGGTGAACTGTTCG

                                                                     1100
TTCAGGCCACCTGGGATACCAGTTCGTCGCGGCTTTTCCGGACACAGTTCCGGATGGTCAGCCCGAAGCGCATCAGCAACCCGAACAATACCGGCGACAG

                                                                     1200
CCGGAACTGCCGTGCCGGTGTGCAGATTAATGACAGCGGTGCGGCGCTGGGATATTACGTCAGCGAGGACGGGTATCCTGGCTGGATGCCGCAGAAATGG

                                                                     1300
ACATGGATACCCCGTGAGTTACCCGGCGGCTCGTTCATTCACGTTTTTGAACCCGTGGAGGACGGGCAGACTCGCGGTGCAAATGTGTTTTACACGGTGA

                                                                     1400
TGGAGCAGATGAAGATGCTCGACACGCTGCAGAACACGCAGCTAGATTAACCCTAGAAAGATAATCATATTGTGACGTACGTTAAAGATAATCATGCGTA
                                                  _____LEFT TERMINAL REPEAT_____>

                                                                     1500
AAATTGACGCATGGGATCCACTAGTGTTCCCACAATGGTTAATTCGAGCTCGCCCGGGGATCTAATTCAATTAGAGACTAATTCAATTAGAGCTAATTCA
_____>
                        _____3XP3-EYFP MARKER_____>

                                                                     1600
ATTAGGATCCAAGCTTATCGATTTCGAACCCTCGACCGCCGGAGTATAAATAGAGGCGCTTCGTCTACGGAGCGACAATTCAATTCAAACAAGCAAAGTG
_____3XP3-EYFP MARKER_____>

                                                                     1700
AACACGTCGCTAAGCGAAAGCTAAGCAAATAAACAAGCGCAGCTGAACAAGGTAAACAATCGGGGTACCGCTAGAGTCGACGGTACGATCCACCGGTCGC
_____3XP3-EYFP MARKER_____>

                                                                     1800
CACCATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGC
_____3XP3-EYFP MARKER_____>

                                                                     1900
GAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCTTCG
_____3XP3-EYFP MARKER_____>

                                                                     2000
GCTACGGCCTGCAGTGCTTCGCCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCAT
_____3XP3-EYFP MARKER_____>

                                                                     2100
CTTCTTCAAGGACGACGGCAACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATCGACTTCAAG
_____3XP3-EYFP MARKER_____>
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Fig. 20(B) cont.

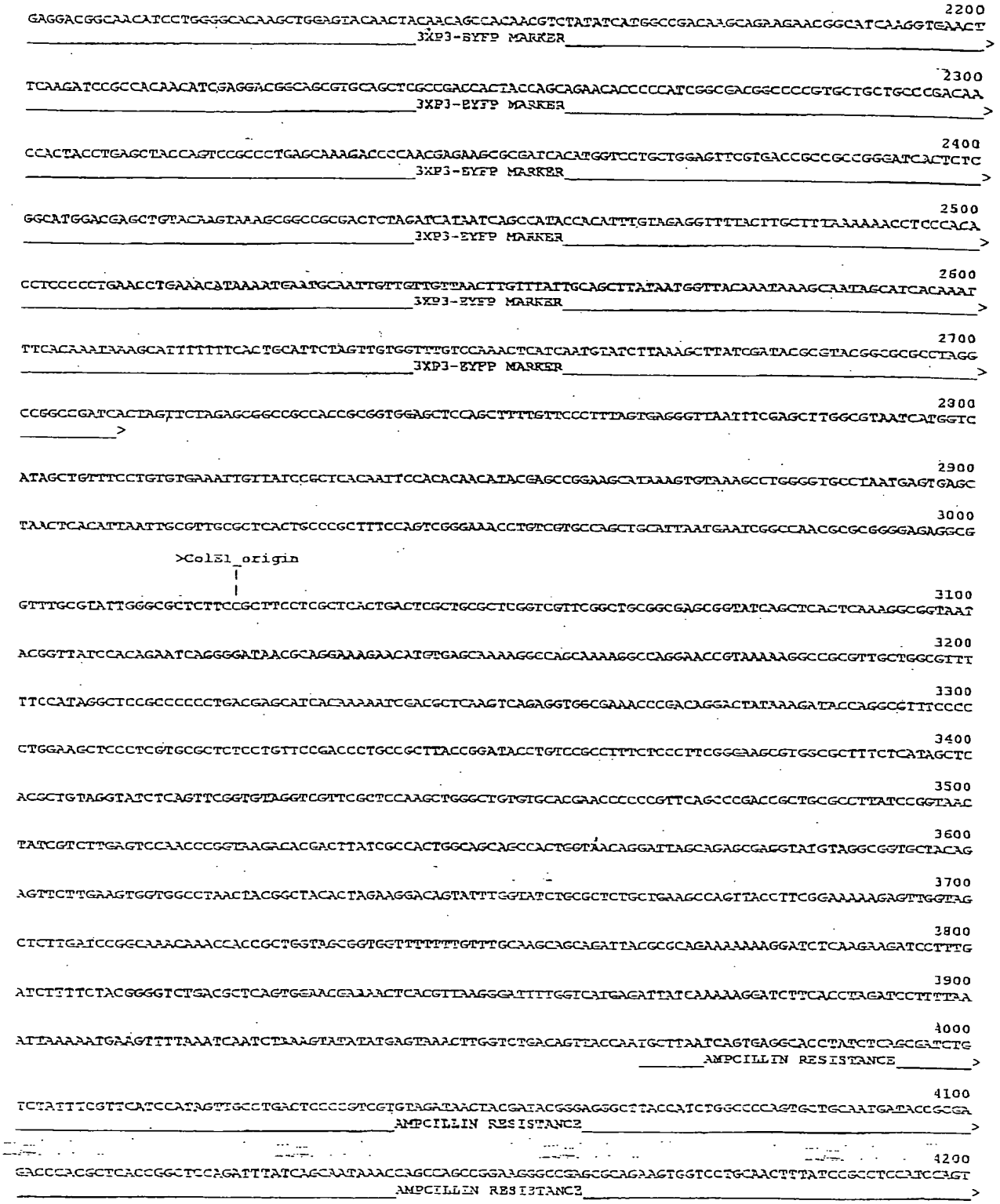

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3XP3-EYFP MARKER
2300
TCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAA
3XP3-EYFP MARKER
2400
CCACTACCTGAGCTACCAGTCCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCCTGCTGGAGTTCGTGACCGCCGCCGGGATCACTCTC
3XP3-EYFP MARKER
2500
GGCATGGACGAGCTGTACAAGTAAAGCGGCCGCGACTCTAGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCCACA
3XP3-EYFP MARKER
2600
CCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAAT
3XP3-EYFP MARKER
2700
TTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTAAAGCTTATCGATACGCGTACGGCGCGCCTAGG
3XP3-EYFP MARKER
2800
CCGGCCGATCACTAGTTCTAGAGCGGCCGCCACCGCGGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGGTTAATTTCGAGCTTGGCGTAATCATGGTC
2900
ATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCACAATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAGTGAGC
3000
TAACTCACATTAATTGCGTTGCGCTCACTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCG
>ColE1_origin
3100
GTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAAT
3200
ACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTT
3300
TTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCC
3400
CTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTC
3500
ACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAAC
3600
TATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAG
3700
AGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAG
3800
CTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTG
3900
ATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAA
4000
ATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTG
AMPCILLIN RESISTANCE
4100
TCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGA
AMPCILLIN RESISTANCE
4200
GACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGT
AMPCILLIN RESISTANCE

FIG. 20(B) cont.

4300
CTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTC
AMPCILLIN RESISTANCE >

4400
GTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCG
AMPCILLIN RESISTANCE >

4500
ATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTG
AMPCILLIN RESISTANCE >

4600
TGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAG
AMPCILLIN RESISTANCE >

4700
CAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT
AMPCILLIN RESISTANCE >

4800
GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACAC
AMPCILLIN RESISTANCE >

4900
GGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAA
AMPCILLIN RESISTANCE >

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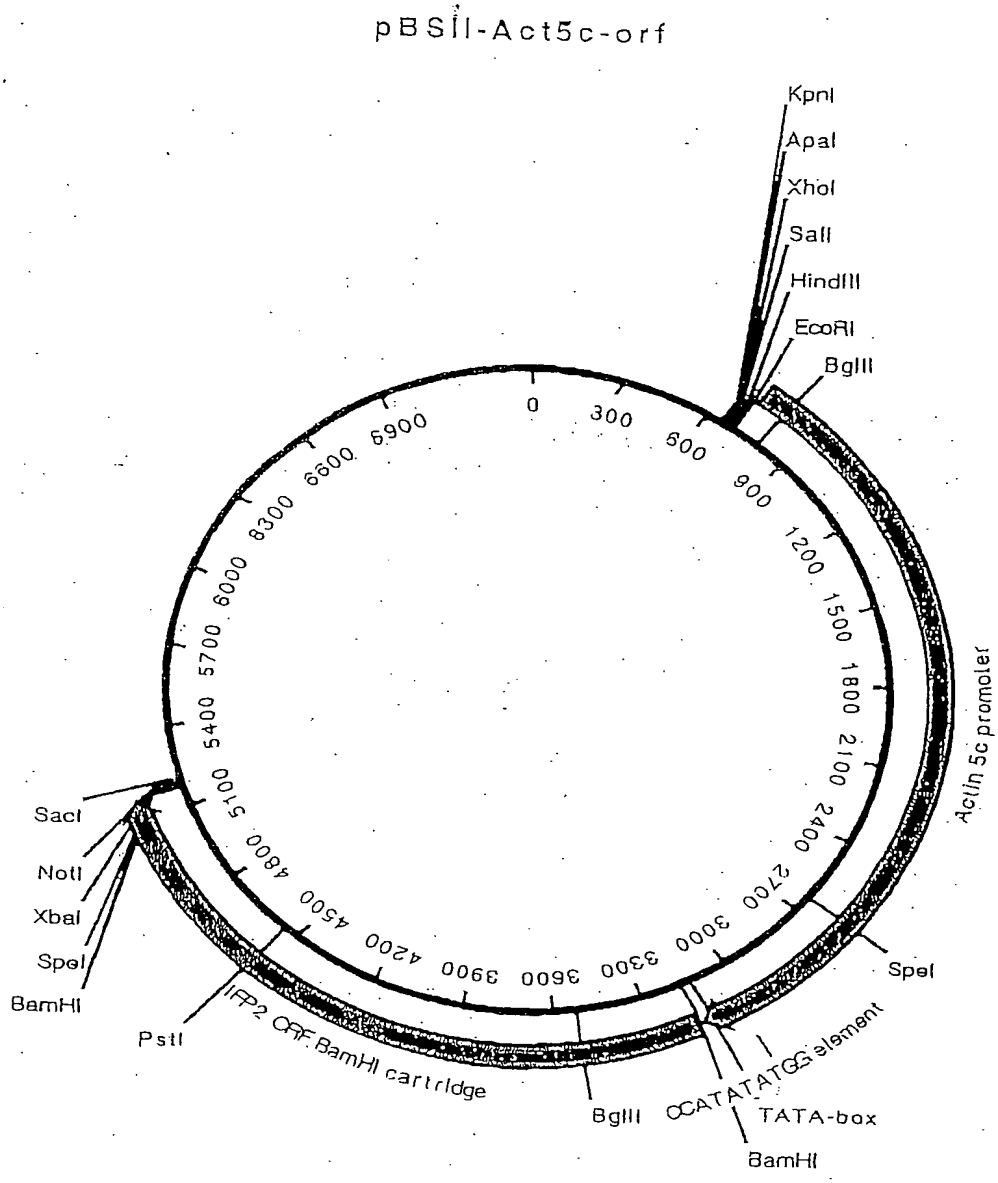

pBSII-Act5c-orf
KpnI
ApaI
XhoI
SalI
HindIII
EcoRI
BglII
0
300
600
900
1200
1500
1800
2100
2400
2700
3000
3300
3600
3900
4200
4500
4800
5100
5400
5700
6000
6300
6600
6900
Actin 5c promoter
SpeI
CCATATATGG element
TATA-box
BamHI
BglII
IIP2 ORF BamHI cartridge
PstI
BamHI
SpeI
XbaI
NotI
SacI

FIG. 21 (A)

pBSII-Act5c-orf

FIG. 21(B)

Sequence Range: 1 to 7411

100
CTAAATTGTAAGCGTTAATATTTTGTTAAAATTCGCGTTAAATTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT

200
AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAA

300
CCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCCTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAG

400
CCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG

500
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGGCGAT

600
CGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAGGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCAGTCACGACGTTG

700
TAAAACGACGGCCAGTGAGCGCGCGTAATACGACTCACTATAGGGCGAATTGGGTACCGGGCCCCCCCTCGAGGTCGACGGTATCGATAAGCTTGATATC

800
GAATTCTAAAAAAAAATCATGAATGGCATCAACTCTGAATCAAATCTTTGCAGATGCACCTACTTCTCATTTCCACTGTCACATCATTTTTCCAGATCTCG
ACTIN 5C PROMOTER >

900
CTGCCTGTTATGTGGCCCACAAACCAAGACACGTTTTATGGCCATTAAAGCTGGCTGATCGTCGCCAAACACCAAATACATATCAATATGTACATTCGAG
ACTIN 5C PROMOTER >

1000
AAAGAAGCGATCAAAGAAGCGTCTTCGGGCGAGTAGGAGAATGCGGAGGAGAAGGAGAACGAGCTGATCTAGTATCTCTCCACAATCCAATGCCAACTGA
ACTIN 5C PROMOTER >

1100
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ACTIN 5C PROMOTER >

1200
AAAGACTCGTCGGTAAGATAAGATTGTGTCACTCGCTGTCTCTCTTCATTTGTCGAAGAATGCTGAGGAATTTCGCGATGACGTCGGCGAGTATTTTGAA
ACTIN 5C PROMOTER >

1300
GAATGAGAATAATTTGTATTTATACGAAAATCAGTTAGTGGAATTTTCTACAAAAACATGTTATCTATAGATAATTTTGTTGCAAAATATGTTGACTATG
ACTIN 5C PROMOTER >

1400
ACAAAGATTGTATGTATATACCTTTAATGTATTCTCATTTTCTTATGTATTTATAATGGCAATGATGATACTGATGATATTTTAAGATGATGCCAGACCA
ACTIN 5C PROMOTER >

1500
CAGGCTGATTTCTGCGTCTTTTGCCGAACGCAGTGCATGTGCGGTTGTTGTTTTTTGGAATAGTTTCAATTTTCGGACTGTCCGCTTTGATTTCAGTTTC
ACTIN 5C PROMOTER >

1600
TTGGCTTATTCAAAAAGCAAAGTAAAGCCAAAAAAGCGAGATGGCAATACCAAATGCGGCAAAACGGTAGTGGAAGGAAAGCGGGTGCGGGGCAGCGGAAG
ACTIN 5C PROMOTER >

1700
GAAGCGTGGGGCGGGGCGTGGCGGGGTCTGTGGCTGGGCGCGACGTCACCGACGTTGGAGCCACTCCTTTGACCATGTGTGCGTGTGTGTATTATTCGTG
ACTIN 5C PROMOTER >

1800
TCTCGCCACTCGCCGGTTGTTTTTTTCTTTTTATCTCGCTCTCTCTAGCGCCATCTCGTACGCATGCTCAACGCACCGCATGTTGCCGTGTCCTTTATGC
ACTIN 5C PROMOTER >

1900
GTCATTTTGGCTCGAAATAGGCAATTATTTAAACAAAGATTAGTCAACGAAAACGCTAAAATAAATAAGTCTACAATATGGTTACTTATTGCCATGTGTG
ACTIN 5C PROMOTER >

2000
TGCAGCCAACGATAGCAACAAAAGCAACAACACAGTGGCTTTCCCTCTTTCACTTTTTGTTTGCAAGCGCGTGCGAGCAAGACGGCACGACCGGCAAACG
ACTIN 5C PROMOTER >

FIG. 21(B) cont.

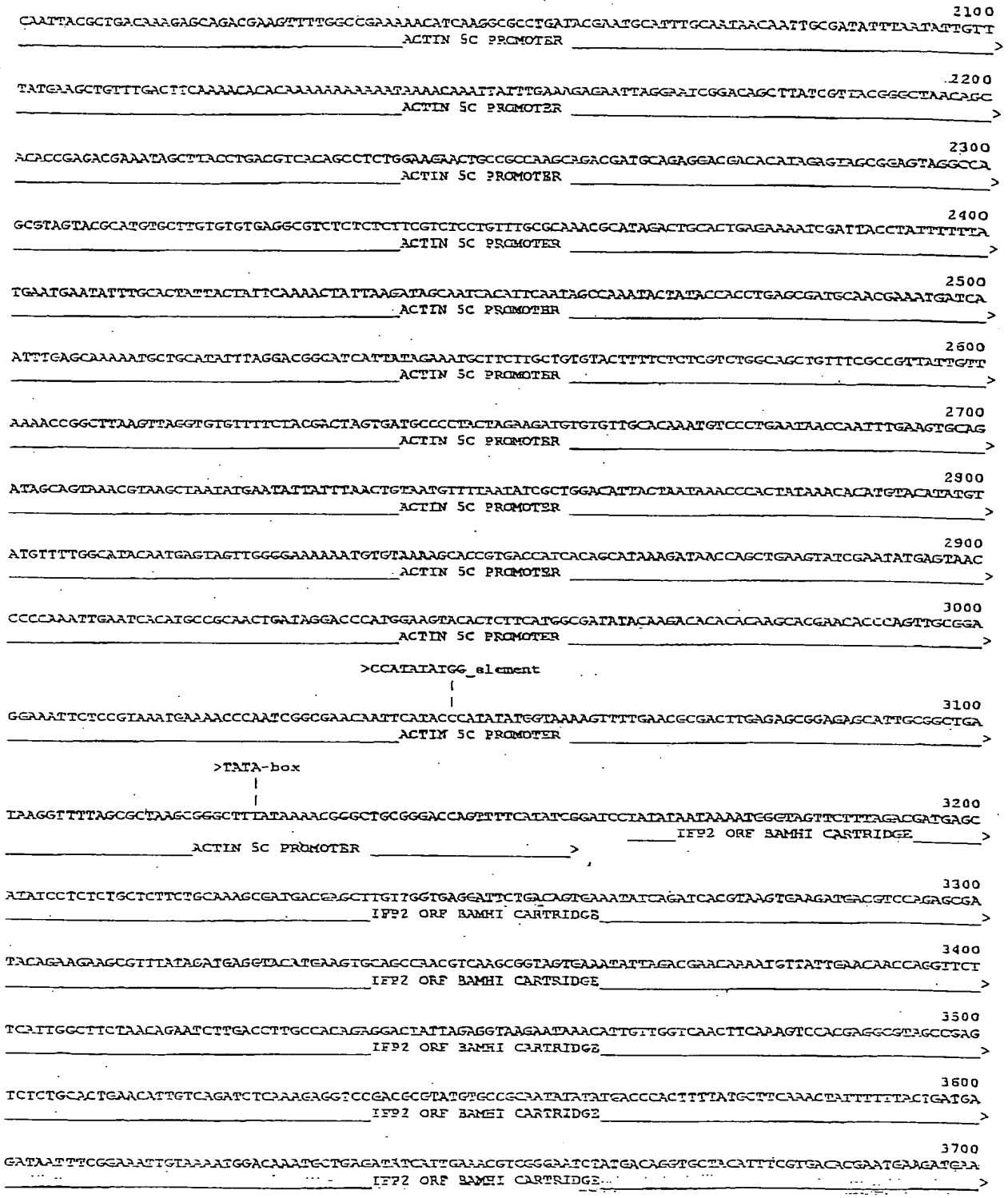

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ACTIN 5C PROMOTER
2200
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2300
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2400
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2500
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2600
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2700
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ACTIN 5C PROMOTER
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ACTIN 5C PROMOTER
3000
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ACTIN 5C PROMOTER
IFP2 ORF BAMHI CARTRIDGE
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IFP2 ORF BAMHI CARTRIDGE
3500
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IFP2 ORF BAMHI CARTRIDGE
3600
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IFP2 ORF BAMHI CARTRIDGE
3700
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IFP2 ORF BAMHI CARTRIDGE

FIG. 21(B) cont.

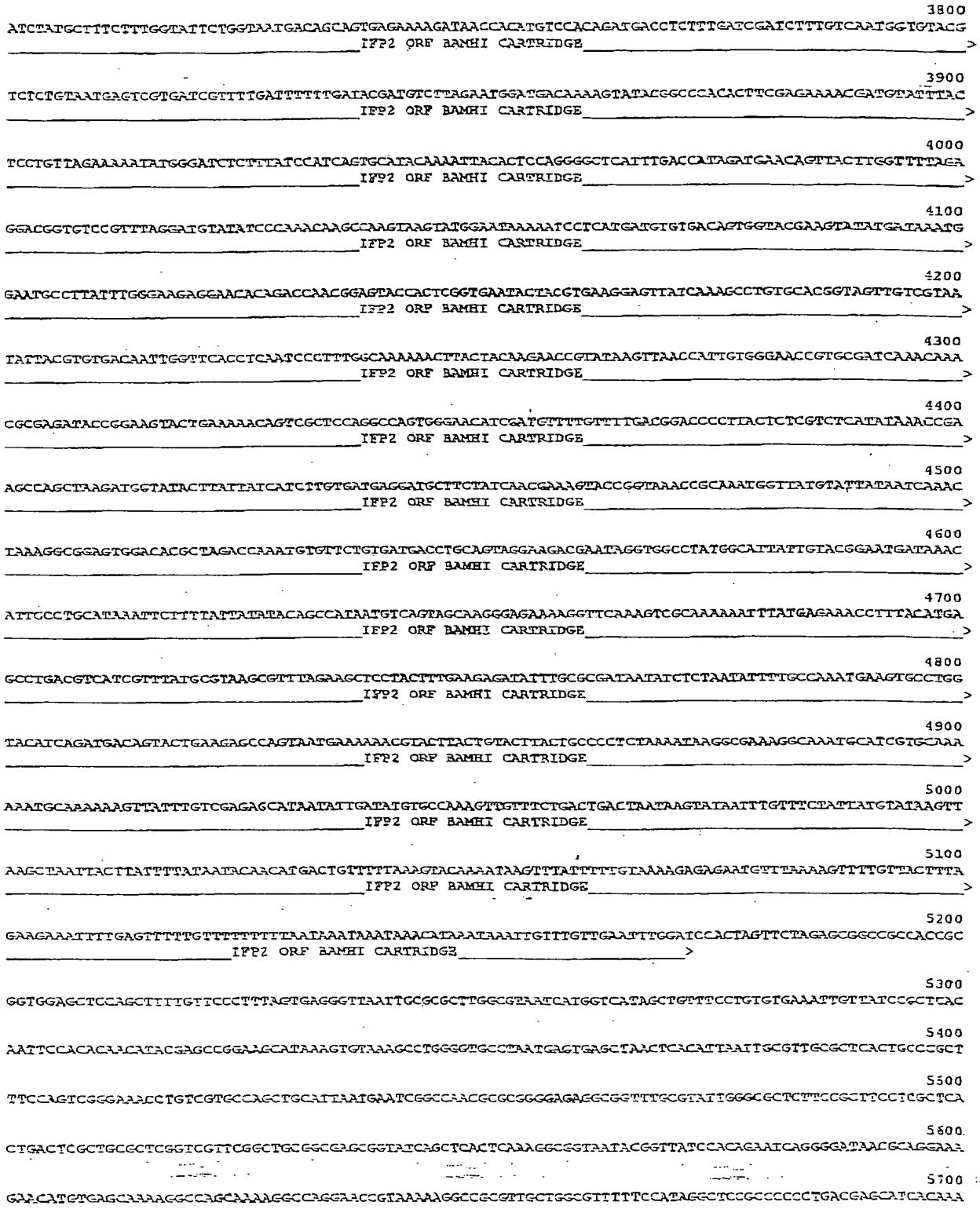

3800
ATCTATGCTTTCTTTGGTATTCTGGTAATGACAGCAGTGAGAAAAGATAACCACATGTCCACAGATGACCTCTTTGATCGATCTTTGTCAATGGTGTACG
IFP2 ORF BAMHI CARTRIDGE
3900
TCTCTGTAATGAGTCGTGATCGTTTTGATTTTTTGAIACGATGTCTTAGAATGGATGACAAAAGTATACGGCCCACACTTCGAGAAAACGATGTATTTAC
IFP2 ORF BAMHI CARTRIDGE
4000
TCCTGTTAGAAAAATATGGGATCTCTTTATCCATCAGTGCATACAAAATTACACTCCAGGGGCTCATTTGACCATAGATGAACAGTTACTTGGTTTTAGA
IFP2 ORF BAMHI CARTRIDGE
4100
GGACGGTGTCCGTTTAGGATGTATATCCCAAACAAGCCAAGTAAGTATGGAATAAAAATCCTCATGATGTGTGACAGTGGTACGAAGTATATGATAAATG
IFP2 ORF BAMHI CARTRIDGE
4200
GAATGCCTTATTTGGGAAGAGGAACACAGACCAACGGAGTACCACTCGGTGAATACTACGTGAAGGAGTTATCAAAGCCTGTGCACGGTAGTTGTCGTAA
IFP2 ORF BAMHI CARTRIDGE
4300
TATTACGTGTGACAATTGGTTCACCTCAATCCCTTTGGCAAAAAACTTACTACAAGAACCGTATAAGTTAACCATTGTGGGAACCGTGCGATCAAACAAA
IFP2 ORF BAMHI CARTRIDGE
4400
CGCGAGATACCGGAAGTACTGAAAAACAGTCGCTCCAGGCCAGTGGGAACATCGATGTTTTGTTTTGACGGACCCCTTACTCTCGTCTCATATAAACCGA
IFP2 ORF BAMHI CARTRIDGE
4500
AGCCAGCTAAGATGGTATACTTATTATCATCTTGTGATGAGGATGCTTCTATCAACGAAAGTACCGGTAAACCGCAAATGGTTATGTATTATAATCAAAC
IFP2 ORF BAMHI CARTRIDGE
4600
TAAAGGCGGAGTGGACACGCTAGACCAAATGTGTTCTGTGATGACCTGCAGTAGGAAGACGAATAGGTGGCCTATGGCATTATTGTACGGAATGATAAAC
IFP2 ORF BAMHI CARTRIDGE
4700
ATTGCCTGCATAAATTCTTTTATTATATACAGCCATAATGTCAGTAGCAAGGGAGAAAAGGTTCAAAGTCGCAAAAAATTTATGAGAAACCTTTACATGA
IFP2 ORF BAMHI CARTRIDGE
4800
GCCTGACGTCATCGTTTATGCGTAAGCGTTTAGAAGCTCCTACTTTGAAGAGATATTTGCGCGATAATATCTCTAATATTTTGCCAAATGAAGTGCCTGG
IFP2 ORF BAMHI CARTRIDGE
4900
TACATCAGATGACAGTACTGAAGAGCCAGTAATGAAAAAACGTACTTACTGTACTTACTGCCCCTCTAAAATAAGGCGAAAGGCAAATGCATCGTGCAAA
IFP2 ORF BAMHI CARTRIDGE
5000
AAATGCAAAAAAGTTATTTGTCGAGAGCATAATATTGATATGTGCCAAAGTTGTTTCTGACTGACTAATAAGTATAATTTGTTTCTATTATGTATAAGTT
IFP2 ORF BAMHI CARTRIDGE
5100
AAGCTAATTACTTATTTTATAATACAACATGACTGTTTTTAAAGTACAAAATAAGTTTATTTTTGTAAAAGAGAGAATGTTTAAAAGTTTTGTTACTTTA
IFP2 ORF BAMHI CARTRIDGE
5200
GAAGAAATTTTGAGTTTTTGTTTTTTTTTAATAAATAAATAAACATAAATAAATTGTTTGTTGAATTTGGATCCACTAGTTCTAGAGCGGCCGCCACCGC
IFP2 ORF BAMHI CARTRIDGE
5300
GGTGGAGCTCCAGCTTTTGTTCCCTTTAGTGAGGGTTAATTGCGCGCTTGGCGTAATCATGGTCATAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCAC
5400
AATTCCACACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCT
5500
TTCCAGTCGGGAAACCTGTCGTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGGCGCTCTTCCGCTTCCTCGCTCA
5600
CTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA
5700
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAA

FIG. 21(B) cont.

5800
AATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCC

5900
TGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCG

6000
CTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTA

6100
TCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTA

6200
GAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGG

6300
TGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAA

6400
AACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATAT

6500
ATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGT

6600
CGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATA

6700
AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTT

6800
CGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACG

6900
ATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCA

7000
CTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAAT

7100
AGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTC

7200
TTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTACTTTCACC

7300
AGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAAT

7400
ATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCG

AAAAGTGCCAC (SEQ ID NO: 67)

pCospa-hs-o

Sequence Range: 1 to 10333

100

AAGCTTGGGCTGCAGGTCGACGGATCCAAATTCAACAAACAATTTATTTATGTTTAT
TTATTTATTAAAAAAAAAACAAAAACTCAAAATTTCTTCTAAAG

200

TAACAAAACTTTTAAACATTCTCTCTTTTACAAAAATAAACTTATTTTGTACTTTAAA
AACAGTCATGTTGTATTATAAAATAAGTAATTAGCTTAACTT

300

ATACATAATAGAAACAAATTATACTTATTAGTCAGTCAGAAACAACTTTGGCACATA
TCAATATTATGCTCTCGACAAATAACTTTTTTGCATTTTTTGC
<_____PIGGYBAC ORF

400

ACGATGCATTTGCCTTTCGCCTTATTTTAGAGGGGCAGTAAGTACAGTAAGTACGTT
TTTTCATTACTGGCTCTTCAGTACTGTCATCTGATGTACCAGG
<_____PIGGYBAC ORF

500

CACTTCATTTGGCAAAATATTAGAGATATTATCGCGCAAATATCTCTTCAAAGTAGG
AGCTTCTAAACGCTTACGCATAAACGATGACGTCAGGCTCATG
<_____PIGGYBAC ORF

600

TAAAGGTTTCTCATAAATTTTTTGCGACTTTGAACCTTTTCTCCCTTGCTACTGACATT
ATGGCTGTATATAATAAAAGAATTTATGCAGGCAATGTTTA

FIG. 22

<_____PIGGYBAC ORF

700

TCATTCCGTACAATAATGCCATAGGCCACCTATTCGTCTTCCTACTGCAGGTCATCAC
AGAACACATTTGGTCTAGCGTGTCCACTCCGCCTTTAGTTTG
<_____PIGGYBAC ORF

800

ATTATAATACATAACCATTTGCGGTTTACCGGTACTTTCGTTGATAGAAGCATCCTCA
TCACAAGATGATAATAAGTATACCATCTTAGCTGGCTTCGGT
<_____PIGGYBAC ORF

900

TTATATGAGACGAGAGTAAGGGGTCCGTCAAAACAAAACATCGATGTTCCCACTGG
CCTGGAGCGACTGTTTTTCAGTACTTCCGGTATCTCGCGTTTGT
<_____PIGGYBAC ORF

1000

TTGATCGCACGGTTCCCACAATGGTTAACTTATACGGTTCTTGTAGTAAGTTTTTTGC
CAAAGGGATTGAGGTGAACCAATTGTCACACGTAATATTACG
<_____PIGGYBAC ORF

1100

ACAACTACCGTGCACAGGCTTTGATAACTCCTTCACGTAGTATTCACCGAGTGGTAC
TCCGTTGGTCTGTGTTCCTCTTCCCAAATAAGGCATTCCATTT
<_____PIGGYBAC ORF

FIG. 22

1200

ATCATATACTTCGTACCACTGTCACACATCATGAGGATTTTTATTCCATACTTACTTG
GCTTGTTTGGGATATACATCCTAAACGGACACCGTCCTCTAA
<_____PIGGYBAC ORF

1300

AACCAAGTAACTGTTCATCTATGGTCAAATGAGCCCCTGGAGTGTAATTTTGTATGC
ACTGATGGATAAAGAGATCCCATATTTTTCTAACAGGAGTAAA
<_____PIGGYBAC ORF

1400

TACATCGTTTTCTCGAAGTGTGGGCCGTATACTTTTGTCATCCATTCTAAGACATCGT
ATCAAAAAATCAAAACGATCACGACTCATTACAGAGACGTAC
<_____PIGGYBAC ORF

1500

ACCATTGACAAAGATCGATCAAAGAGGTCATCTGTGGACATGTGGTTATCTTTTCTC
ACTGCTGTCATTACCAGAATACCAAAGAAAGCATAGATTTCAT
<_____PIGGYBAC ORF

1600

CTTCATTCGTGTCACGAAATGTAGCACCTGTCATAGATTCCCGACGTTTCAATGATAT
CTCAGCATTTGTCCATTTTACAATTTCCGAAATTATCTCATC
<_____PIGGYBAC ORF

1700

AGTAAAAAATAGTTTGAAGCATAAAAGTGGGTCATATATATTGCGGCACATACGCG
TCGGACCTCTTTGAGATCTGACAATGTTCAGTGCAGAGACTCGG

FIG. 22

<_____PIGGYBAC ORF

1800

CTACGCCTCGTGGACTTTGAAGTTGACCAACAATGTTTATTCTTACCTCTAATAGTCC
TCTGTGGCAAGGTCAAGATTCTGTTAGAAGCCAATGAAGAAC
<_____PIGGYBAC ORF

1900

CTGGTTGTTCAATAACATTTTGTTCGTCTAATATTTCACTACCGCTTGACGTTGGCTG
CACTTCATGTACCTCATCTATAAACGCTTCTTCTGTATCGCT
<_____PIGGYBAC ORF

2000

CTGGACGTCATCTTCACTTACGTGATCTGATATTTCACTGTCAGAATCCTCACCAACA
AGCTCGTCATCGCTTTGCAGAAGAGCAGAGAGGATATGCTCA
<_____PIGGYBAC ORF

2100

TCGTCTAAAGAACTACCCATTTTATTATATAGGATCCCCGACACCAGACCAACTGGT
AATGGTAGCGACCGGCGCTCAGCTGGAATTAGGCCTTCTAGAC
<___PIGGYBAC ORF ____

2200

CGCGGCCGCAGATCTGTTAACGAATTCCCAATTCCCTATTCAGAGTTCTCTTCTTGTA
TTCAATAATTACTTCTTGGCAGATTTCAGTAGTTGCAGTTGA
<_____HSP 70
PROMOTER_____

2300

FIG. 22

TTTACTTGGTTGCTGGTTACTTTTAATTGATTCACTTTAACTTGCACTTTACTGCAGAT
TGTTTAGCTTGTTCAGCTGCGCTTGTTTATTTGCTTAGCTT
<_____HSP 70
PROMOTER_____

2400

TCGCTTAGCGACGTGTTCACTTTGCTTGTTTGAATTGAATTGTCGCTCCGTAGACGAA
GCGCTCTATTTATACTCCGGCGCTCTTTTCGCGAACATTCGA
<_____HSP 70
PROMOTER_____

2500

GGCGCGCTCTCTCGAACCAACGAGAGCAGTATGCCGTTTACTGTGTGACAGAGTGA
GAGAGCATTAGTGCAGAGAGGGAGACCCAAAAAGAAAAGAGAGA
<_____HSP 70
PROMOTER_____

2600

ATAACGAATAACGGCCAGAGAAATTTCTCGAGTTTTCTTCTGCCAAACAAATGACCT
ACCACAATAACCAGTTTGTTTTGGGATTCTAGGGGGATCGGGG
<_____HSP 70
PROMOTER_____

2700

ATCAATTCTAGTATGTATGTAAGTTAATAAAACCCTTTTTTGGAGAATGTAGATTTAA
AAAAACATATTTTTTTTTTATTTTTTACTGCACTGGATATCA
<_____

2800

TTGAACTTATCTGATCAGTTTTAAATTTACTTCGATCCAAGGGTATTTGAAGTACCAG
GTTCTTTCGATTACCTCTCACTCAAAATGACATTCCACTCAA

FIG. 22

2900

AGTCAGCGCTGTTTGCCTCCTTCTCTGTCCACAGAAATATCGCCGTCTCTTTCGCCGC
TGCGTCCGCTATCTCTTTCGCCACCGTTTGTAGCGTTACCTA

3000

GCGTCAATGTCCGCCTTCAGTTGCACTTTGTCAGCGGTTTCGTGACGAAGCTCCAAG
CGGTTTACGCCATCAATTAAACACAAAGTGCTGTGCCAAAACT

3100

CCTCTCGCTTCTTATTTTTGTTTGTTTTTTTGAGTGATTGGGGTGGTGATTGGTTTTGGG
TGGGTAAGCAGGGGAAAGTGTGAAAAATCCCGGCAATGGGC

3200

CAAGAGGATCAGGAGCTATTAATTCGCGGAGGCAGCAAACACCCATCTGCCGAGCA
TCTGAACAATGTGAGTAGTACATGTGCATACATCTTAAGTTCAC

3300

TTGATCTATAGGAACTGCGATTGCAACATCAAATTGTCTGCGGCGTGAGAACTGCGA
CCCACAAAAATCCCAAACCGCAATCGCACAAACAAATAGTGAC

3400

ACGAAACAGATTATTCTGGTAGCTGTGCTCGCTATATAAGACAATTTTTAAGATCAT
ATCATGATCAAGACATCTAAAGGCATTCATTTTCGACTACATT

3500

CTTTTTTACAAAAAATATAACAACCAGATATTTTAAGCTGATCCTAGATGCACAAAA
AATAAATAAAAGTATAAACCTACTTCGTAGGATACTTCGTTTT

3600

GTTCGGGGTTAGATGAGCATAACGCTTGTAGTTGATATTTGAGATCCCCTATCATTG

FIG. 22

CAGGGTGACAGCGGAGCGGCTTCGCAGAGCTGCATTAACCAGG

3700

GCTTCGGGCAGGCCAAAAACTACGGCACGCTCCTGCCACCCAGTCCGCCGGAGGAC
TCCGGTTCAGGGAGCGGCCAACTAGCCGAGAACCTCACCTATGC

3800

CTGGCACAATATGGACATCTTTGGGGCGGTCAATCAGCCGGGCTCCGGATGGCGGC
AGCTGGTCAACCGGACACGCGGACTATTCTGCAACGAGCGACAC

3900

ATACCGGCGCCCAGGAAACATTTGCTCAAGAACGGTGAGTTTCTATTCGCAGTCGGC
TGATCTGTGTGAAATCTTAATAAAGGGTCCAATTACCAATTTG

4000

AAACTCAGTTTGCGGCGTGGCCTATCCGGGCGAACTTTTGGCCGTGATGGGCAGTTC
CGGTGCCGGAAAGACGACCCTGCTGAATGCCCTTGCCTTTCGA

4100

TCGCCGCAGGGCATCCAAGTATCGCCATCCGGGATGCGACTGCTCAATGGCCAACCT
GTGGACGCCAAGGAGATGCAGGCCAGGTGCGCCTATGTCCAGC

4200

AGGATGACCTCTTTATCGGCTCCCTAACGGCCAGGGAACACCTGATTTTCCAGGCCA
TGGTGCGGATGCCACGACATCTGACCTATCGGCAGCGAGTGGC

4300

CCGCGTGGATCAGGTGATCCAGGAGCTTTCGCTCAGCAAATGTCAGCACACGATCAT
CGGTGTGCCCGGCAGGGTGAAAGGTCTGTCCGGCGGAGAAAGG

4400

FIG. 22

AAGCGTCTGGCATTCGCCTCCGAGGCACTAACCGATCCGCCGCTTCTGATCTGCGAT
GAGCCCACCTCCGGACTGGACTCATTTACCGCCCACAGCGTCG

4500

TCCAGGTGCTGAAGAAGCTGTCGCAGAAGGGCAAGACCGTCATCCTGACCATTCAT
CAGCCGTCTTCCGAGCTGTTTGAGCTCTTTGACAAGATCCTTCT

4600

GATGGCCGAGGGCAGGGTAGCTTTCTTGGGCACTCCCAGCGAAGCCGTCGACTTCTT
TTCCTAGTGAGTTCGATGTGTTTATTAAGGGTATCTAGCATTA

4700

CATTACATCTCAACTCCTATCCAGCGTGGGTGCCCAGTGTCCTACCAACTACAATCC
GGCGGACTTTTACGTACAGGTGTTGGCCGTTGTGCCCGGACGG

4800

GAGATCGAGTCCCGTGATCGGATCGCCAAGATATGCGACAATTTTGCTATTAGCAAA
GTAGCCCGGGATATGGAGCAGTTGTTGGCCACCAAAAATTTGG

4900

AGAAGCCACTGGAGCAGCCGGAGAATGGGTACACCTACAAGGCCACCTGGTTCATG
CAGTTCCGGGCGGTCCTGTGGCGATCCTGGCTGTCGGTGCTCAA

5000

GGAACCACTCCTCGTAAAAGTGCGACTTATTCAGACAACGGTGAGTGGTTCCAGTGG
AAACAAATGATATAACGCTTACAATTCTTGGAAACAAATTCGC

5100

TAGATTTTAGTTAGAATTGCCTGATTCCACACCCTTCTTAGTTTTTTTCAATGAGATG
TATAGTTTATAGTTTTGCAGAAAATAAATAAATTTCATTTAA

FIG. 22

5200

CTCGCGAACATGTTGAAGATATGAATATTAATGAGATGCGAGTAACATTTTAATTTG
CAGATGGTTGCCATCTTGATTGGCCTCATCTTTTTGGGCCAAC

5300

AACTCACGCAAGTGGGCGTGATGAATATCAACGGAGCCATCTTCCTCTTCCTGACCA
ACATGACCTTTCAAAACGTCTTTGCCACGATAAATGTAAGTCT

5400

TGTTTAGAATACATTTGCATATTAATAATTTACTAACTTTCTAATGAATCGATTCGAT
TTAGGTGTTCACCTCAGAGCTGCCAGTTTTTATGAGGGAGGC

5500

CCGAAGTCGACTTTATCGCTGTGACACATACTTTCTGGGCAAAACGATTGCCGAATT
ACCGCTTTTTCTCACAGTGCCACTGGTCTTCACGGCGATTGCC

5600

TATCCGATGATCGGACTGCGGGCCGGAGTGCTGCACTTCTTCAACTGCCTGGCGCTG
GTCACTCTGGTGGCCAATGTGTCAACGTCCTTCGGATATCTAA

5700

TATCCTGCGCCAGCTCCTCGACCTCGATGGCGCTGTCTGTGGGTCCGCCGGTTATCAT
ACCATTCCTGCTCTTTGGCGGCTTCTTCTTGAACTCGGGCTC

5800

GGTGCCAGTATACCTCAAATGGTTGTCGTACCTCTCATGGTTCCGTTACGCCAACGA
GGGTCTGCTGATTAACCAATGGGCGGACGTGGAGCCGGGCGAA

5900

ATTAGCTGCACATCGTCGAACACCACGTGCCCCAGTTCGGGCAAGGTCATCCTGGA

FIG. 22

GACGCTTAACTTCTCCGCCGCCGATCTGCCGCTGGACTACGTGG

6000

GTCTGGCCATTCTCATCGTGAGCTTCCGGGTGCTCGCATATCTGGCTCTAAGACTTCG
GGCCCGACGCAAGGAGTAGCCGACATATATCCGAAATAACTG

6100

CTTGTTTTTTTTTTTACCATTATTACCATCGTGTTTACTGTTTATTGCCCCCTCAAAAA
GCTAATGTAATTATATTTGTGCCAATAAAAACAAGATATGA

6200

CCTATAGAATACAAGTATTTCCCCTTCGAACATCCCCACAAGTAGACTTTGGATTTG
TCTTCTAACCAAAAGACTTACACACCTGCATACCTTACATCAA

6300

AAACTCGTTTATCGCTACATAAAACACCGGGATATATTTTTTATATACATACTTTTCA
AATCGCGCGCCCTCTTCATAATTCACCTCCACCACACCACGT

6400

TTCGTAGTTGCTCTTTCGCTGTCTCCCACCCGCTCTCCGCAACACATTCACCTTTTGTT
CGACGACCTTGGAGCGACTGTCGTTAGTTCCGCGCGATTCG

6500

GTTCGCTCAAATGGTTCCGAGTGGTTCATTTCGTCTCAATAGAAATTAGTAATAAAT
ATTTGTATGTACAATTTATTTGCTCCAATATATTTGTATATAT

6600

TTCCCTCACAGCTATATTTATTCTAATTTAATATTATGACTTTTTAAGGTAATTTTTTG
TGACCTGTTCGGAGTGATTAGCGTTACAATTTGAACTGAAA

6700

FIG. 22

GTGACATCCAGTGTTTGTTCCTTGTGTAGATGCATCTCAAAAAAATGGTGGGCATAA
TAGTGTTGTTTATATATATCAAAAATAAGAACTATAATAATAA

6800

GAATACATTTAATTTAGAAAATGCTTGGATTTCACTGGAACTAGAATTAATTCGGCT
GCTGCTCTAAACGACGCATTTCGTACTCCAAAGTACGAATTTT

6900

TTCCCTCAAGCTCTTATTTTCATTAAACAATGAACAGGACCTAACGCACAGTCACGT
TATTGTTTACATAAATGATTTTTTTTACTATTCAAACTTACTC

7000

TGTTTGTGTACTCCCACTGGTATAGCCTTCTTTTATCTTTTCTGGTTCAGGCTCTATCA
CTTTACTAGGTACGGCATCTGCGTTGAGTCGCCTCCTTTTA

7100

AATGTCTGACCTTTTGCAGGTGCAGCCTTCCACTGCGAATCTTTAAAGTGGGTATCA
CAAATTTGGGAGTTTTCACCAAGGCTGCACCCAAGGCTCTGCT

7200

CCCACAATTTTCTCTTAATAGCACACTTCGGCACGTGAATTAATTTTACTCCAGTCAC
AGCTTTGCAGCAAAATTTGCAATATTTCATTTTTTTTTATTC

7300

CACGTAAGGGTTAATGTTTTCAAAAAAAAAATTCGTCCGCACACAACCTTTCCTCTCA
ACAAGCAAACGTGCACTGAATTTAAGTGTATACTTCGGTAAGC

7400

TTCGGCTATCGACGGGACCACCTTATGTTATTTCATCATGGGCCAGACCCACGTAGT
CCAGCGGCAGATCGGCGGCGGAGAAGTTAAGCGTCTCCAGGAT

FIG. 22

7500

GACCTTGCCCGAACTGGGGCACGTGGTGTTCGACGATGTGCAGCTAATTTCGCCCGG
CTCCACGTCCGCCCATTGGTTAATCAGCAGACCCTCGTTGGCG

7600

TAACGGAACCATGAGAGGTACGACAACCATTTGAGGTATACTGGCACCGAGCCCGA
GTTCAAGAAGAAGGCGTTTTTCCATAGGCTCCGCCCCCCTGACG

7700

AGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAA
AGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCC

7800

TGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTG
GCGCTTTCTCAATGCTCACGCTGTAGGTATCTCAGTTCGGTG

7900

TAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGC
TGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAA

8000

GACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGG
TATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTA

8100

CGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTT
CGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACC

8200

GCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGG

FIG. 22

ATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTC

8300

AGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATC
TTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAAT

8400

CTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGC
ACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATAGTTGCC

8500

TGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGT
GCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATT

8600

TATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACT
TTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAG

8700

AGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCAT
CGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCC

8800

GGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTT
AGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCG

8900

CAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATC
CGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTC

9000

FIG. 22

ATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGA
TAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATT

9100

GGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGT
TCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTT

9200

TTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAA
AAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTT

9300

CCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATA
TTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGC

9400

ACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATTA
ACCTATAAAAATAGGCGTATCACGAGGCCCTTTCGTCTCGCGC

9500

GTTTCGGTGATGACGGTGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACA
GCTTGTCTGTAAGCGGATGCCGGGAGCAGACAAGCCCGTCAGGG

9600

CGCGTCAGCGGGTGTTGGCGGGTGTCGGGGCTGGCTTAACTATGCGGCATCAGAGC
AGATTGTACTGAGAGTGCACCATATGCGGTGTGAAATACCGCAC

9700

CGAATCGCGCGGAACTAACGACAGTCGCTCCAAGGTCGTCGAACAAAAGGTGAATG
TGTTGCGGAGAGCGGGTGGGAGACAGCGAAAGAGCAACTACGAA

FIG. 22

9800

ACGTGGTGTGGTGGAGGTGAATTATGAAGAGGGCGCGCGATTTGAAAAGTATGTAT
ATAAAAAATATATCCCGGTGTTTTATGTAGCGATAAACGAGTTT

9900

TTGATGTAAGGTATGCAGGTGTGTAAGTCTTTTGGTTAGAAGACAAATCCAAAGTCT
ACTTGTGGGGATGTTCGAAGGGGAAATACTTGTATTCTATAGG

10000

TCATATCTTGTTTTTATTGGCACAAATATAATTACATTAGCTTTTTGAGGGGGCAATA
AACAGTAAACACGATGGTAATAATGGTAAAAAAAAAAAACAAG

10100

CAGTTATTTCGGATATATGTCGGCTACTCCTTGCGTCGGGCCCGAAGTCTTAGAGCC
AGATATGCGAGCACCCGGAAGCTCACGATGAGAATGGCCAGAC

10200

CATGATGAAATAACATAAGGTGGTCCCGTCGGCAAGAGACATCCACTTAACGTATG
CTTGCAATAAGTGCGAGTGAAAGGAATAGTATTCTGAGTGTCGT

10300

ATTGAGTCTGAGTGAGACAGCGATATGATTGTTGATTAACCCTTAGCATGTCCGTGG
GGTTTGAATTAACTCATAATATTAATTAGACGAAATTATTTTT

AAAGTTTTATTTTTAATAATTTGCGAGTACGCA (SEQ ID NO: 68)

FIG. 22

FIG. 23

Natural piggyBac orf	1	ATGGGTAGTT	CTTTAGACGA	TGAGCATATC	CTCTCTGCTC	TTCTGCAAAG
Optimized piggyBac orf	1	ATGGGTAGca	gccTgGAtGA	TGAaCATATC	CTgagcGCgC	TgCTGCAgAG
Natural piggyBac orf	51	CGATGACGAG	CTTGTTGGTG	AGGATTCTGA	CAGTGAAATA	TCAGATCACG
Optimized piggyBac orf	51	CGAcGAcGAa	CTgGTTGGTG	AaGATagcGA	cAGcGAAATc	agcGATCACG
Natural piggyBac orf	101	TAAGTGAAGA	TGACGTCCAG	AGCGATACAG	AAGAAGCGTT	TATAGATGAG
Optimized piggyBac orf	101	TgAGcGAAGA	cGAcGTtCAG	AGCGATACcG	AAGAAGCGTT	cATcGAcGAa
Natural piggyBac orf	151	GTACATGAAG	TGCAGCCAAC	GTCAAGCGGT	AGTGAAATAT	TAGACGAACA
Optimized piggyBac orf	151	GTtCAcGAAG	TGCAGCCgAC	cagcAGCGGT	AGcGAAATcc	TgGAtGAACA
Natural piggyBac orf	201	AAATGTTATT	GAACAACCAG	GTTCTTCATT	GGCTTCTAAC	AGAATCTTGA
Optimized piggyBac orf	201	gAAcGTTATc	GAACAgCCgG	GTagcagccT	GGCgagcAAC	cGtATCcTGA
Natural piggyBac orf	251	CCTTGCCACA	GAGGACTATT	AGAGGTAAGA	ATAAACATTG	TTGGTCAACT
Optimized piggyBac orf	251	CCcTGCCgCA	GcGcACcATc	cGtGGTAAaA	AcAAACAcTG	TTGGagcACc
Natural piggyBac orf	301	TCAAAGTCCA	CGAGGCGTAG	CCGAGTCTCT	GCACTGAACA	TTGTCAGATC
Optimized piggyBac orf	301	agcAAaagCA	CccGcCGTAG	CCGtGTtagc	GCgCTGAACA	TTGTtcGtag
Natural piggyBac orf	351	TCAAAGAGGT	CCGACGCGTA	TGTGCCGCAA	TATATATGAC	CCACTTTTAT
Optimized piggyBac orf	351	cCAgcGtGGT	CCGACcCGTA	TGTGCCGCAA	cATcTAcGAt	CCgCTgcTgT
Natural piggyBac orf	401	GCTTCAAACT	ATTTTTTACT	GATGAGATAA	TTTCGGAAAT	TGTAAAATGG
Optimized piggyBac orf	401	GCTTCAAACT	gTTcTTcACc	GATGAaATcA	TcagcGAAAT	cGTgAAATGG
Natural piggyBac orf	451	ACAAATGCTG	AGATATCATT	GAAACGTCGG	GAATCTATGA	CAGGTGCTAC
Optimized piggyBac orf	451	ACcAAcGCcG	AaATcagccT	GAAACGTCGc	GAAagcATGA	CcGGcGCgAC
Natural piggyBac orf	501	ATTTCGTGAC	ACGAATGAAG	ATGAAATCTA	TGCTTTCTTT	GGTATTCTGG
Optimized piggyBac orf	501	cTTcCGcGAt	ACcAAcGAaG	ATGAaATCTA	cGCcTTCTTc	GGTATcCTGG
Natural piggyBac orf	551	TAATGACAGC	AGTGAGAAAA	GATAACCACA	TGTCCACAGA	TGACCTCTTT
Optimized piggyBac orf	551	TgATGACcGC	gGTGcGtAAA	GATAACCACA	TGagCACcGA	TGAtCTgTTT
Natural piggyBac orf	601	GATCGATCTT	TGTCAATGGT	GTACGTCTCT	GTAATGAGTC	GTGATCGTTT
Optimized piggyBac orf	601	GATCGtagcc	TGagcATGGT	tTACGTtagc	GTtATGAGcC	GtGAcCGTTT
Natural piggyBac orf	651	TGATTTTTTG	ATACGATGTC	TTAGAATGGA	TGACAAAAGT	ATACGGCCCA
Optimized piggyBac orf	651	cGATTTtcTG	ATcCGtTGTC	TgcGtATGGA	TGAtAAAAGc	ATcCGcCCgA
Natural piggyBac orf	701	CACTTCGAGA	AAACGATGTA	TTTACTCCTG	TTAGAAAAAT	ATGGGATCTC
Optimized piggyBac orf	701	CcCTgCGcGA	AAACGATGTg	TTcACcCCgG	TTcGcAAAAT	cTGGGATCTg

FIG. 23 cont.

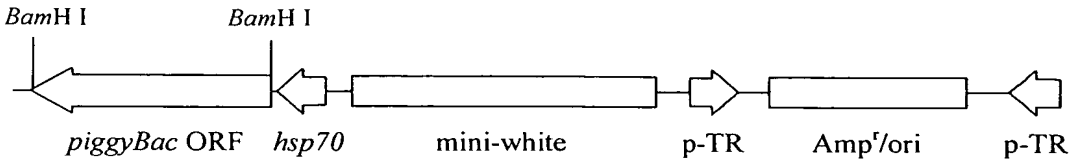
Natural piggyBac orf	751	TTTATCCATC	AGTGCATACA	AAATTACACT	CCAGGGGCTC	ATTTGACCAT
Optimized piggyBac orf	751	TTcATCCAcC	AGTGCATcCA	gAAcTACACc	CCgGGcGCgC	AccTGACCAT
Natural piggyBac orf	801	AGATGAACAG	TTACTTGGTT	TTAGAGGACG	GTGTCCGTTT	AGGATGTATA
Optimized piggyBac orf	801	cGATGAACAG	cTgCTgGGTT	TTcGtGGtCG	cTGTCCGTTT	cGtATGTAcA
Natural piggyBac orf	851	TCCCAAACAA	GCCAAGTAAG	TATGGAATAA	AAATCCTCAT	GATGTGTGAC
Optimized piggyBac orf	851	TCCCgAACAA	aCCgAGcAAa	TAcGGtATcA	AAATCCTgAT	GATGTGTGAc
Natural piggyBac orf	901	AGTGGTACGA	AGTATATGAT	AAATGGAATG	CCTTATTTGG	GAAGAGGAAC
Optimized piggyBac orf	901	AGcGGTACcA	AgTAcATGAT	cAAcGGtATG	CCgTATcTGG	GtcGtGGtAC
Natural piggyBac orf	951	ACAGACCAAC	GGAGTACCAC	TCGGTGAATA	CTACGTGAAG	GAGTTATCAA
Optimized piggyBac orf	951	cCAGACCAAC	GGtGTgCCgC	TgGGTGAATA	CTACGTGAAa	GAacTgagcA
Natural piggyBac orf	1001	AGCCTGTGCA	CGGTAGTTGT	CGTAATATTA	CGTGTGACAA	TTGGTTCACC
Optimized piggyBac orf	1001	AaCCgGTGCA	CGGTAGcTGT	CGTAAcATcA	CcTGTGAcAA	cTGGTTCACC
Natural piggyBac orf	1051	TCAATCCCTT	TGGCAAAAAA	CTTACTACAA	GAACCGTATA	AGTTAACCAT
Optimized piggyBac orf	1051	agcATCCCgc	TGGCgAAAAA	GcTgCTgCAg	GAACCGTATA	AacTgACCAT
Natural piggyBac orf	1101	TGTGGGAACC	GTGCGATCAA	ACAAACGCGA	GATACCGGAA	GTACTGAAAA
Optimized piggyBac orf	1101	cGTGGGtACC	GTtCGtagcA	ACAAACGtGA	aATcCCGGAA	GTgCTGAAAA
Natural piggyBac orf	1151	ACAGTCGCTC	CAGGCCAGTG	GGAACATCGA	TGTTTTGTTT	TGACGGACCC
Optimized piggyBac orf	1151	ACAGcCGtag	CcGtCCgGTG	GGcACcagcA	TGTTcTGTTT	cGAtGGtCCg
Natural piggyBac orf	1201	CTTACTCTCG	TCTCATATAA	ACCGAAGCCA	GCTAAGATGG	TATACTTATT
Optimized piggyBac orf	1201	CTgACcCTgG	TtagcTAcAA	ACCGAAaCCG	GCgAAaATGG	TgTACcTgcT
Natural piggyBac orf	1251	ATCATCTTGT	GATGAGGATG	CTTCTATCAA	CGAAAGTACC	GGTAAACCGC
Optimized piggyBac orf	1251	gagcagcTGc	GAcGAaGAcG	CgagcATCAA	CGAAAGcACC	GGTAAACCGC
Natural piggyBac orf	1301	AAATGGTTAT	GTATTATAAT	CAAACTAAAG	GCGGAGTGGA	CACGCTAGAC
Optimized piggyBac orf	1301	AgATGGTTAT	GTAcTAcAAc	CAgACcAAAG	GCGGtGTGGA	cACcCTgGAt
Natural piggyBac orf	1351	CAAATGTGTT	CTGTGATGAC	CTGCAGTAGG	AAGACGAATA	GGTGGCCTAT
Optimized piggyBac orf	1351	CAgATGTGca	gcGTtATGAC	CTGCAGccGc	AAaACcAAcc	GcTGGCCgAT
Natural piggyBac orf	1401	GGCATTATTG	TACGGAATGA	TAAACATTGC	CTGCATAAAT	TCTTTTATTA
Optimized piggyBac orf	1401	GGCgcTgcTG	TACGGtATGA	TcAACATcGC	CTGCATcAAc	agcTTTATcA
Natural piggyBac orf	1451	TATACAGCCA	TAATGTCAGT	AGCAAGGGAG	AAAAGGTTCA	AAGTCGCAAA
Optimized piggyBac orf	1451	TcTACAGCCA	TAAcGTtAGc	AGCAAaGGtG	AAAAaGTTCA	gAGcCGCAAA

FIG. 23 (cont.)

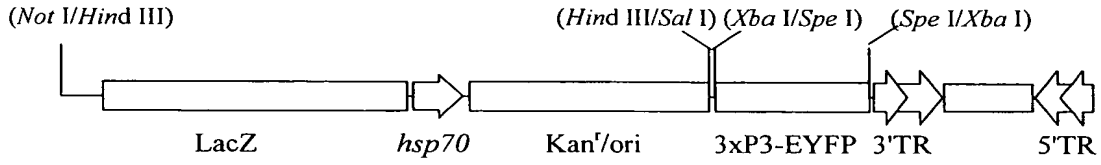
Natural piggyBac orf	1501	AAATTTATGA	GAAACCTTTA	CATGAGCCTG	ACGTCATCGT	TTATGCGTAA
Optimized piggyBac orf	1501	AAATTTATGc	GtAACCTgTA	CATGAGCCTG	ACcagcagcT	TcATGCGTAA
Natural piggyBac orf	1551	GCGTTTAGAA	GCTCCTACTT	TGAAGAGATA	TTTGCGCGAT	AATATCTCTA
Optimized piggyBac orf	1551	aCGTcTgGAA	GCcCCgACcc	TGAAacGtTA	TcTGCGCGAT	AAcATCagcA
Natural piggyBac orf	1601	ATATTTTGCC	AAATGAAGTG	CCTGGTACAT	CAGATGACAG	TACTGAAGAG
Optimized piggyBac orf	1601	AcATccTGCC	gAAcGAAGTG	CCgGGTACca	gcGATGAtAG	cACcGAAGAa
Natural piggyBac orf	1651	CCAGTAATGA	AAAAACGTAC	TTACTGTACT	TACTGCCCCT	CTAAAATAAG
Optimized piggyBac orf	1651	CCgGTgATGA	AAAAACGTAC	cTACTGTACc	TACTGCCCga	gcAAAATccG
Natural piggyBac orf	1701	GCGAAAGGCA	AATGCATCGT	GCAAAAAATG	CAAAAAAGTT	ATTTGTCGAG
Optimized piggyBac orf	1701	cCGtAAaGCg	AAcGCgagcT	GCAAAAAATG	CAAAAAAGTT	ATcTGTCGtG
Natural piggyBac orf	1751	AGCATAATAT	TGATATGTGC	CAAAGTTGTT	TCTGA (SEQ ID NO: 69)	
Optimized piggyBac orf	1751	AaCATAAcAT	cGATATGTGC	CAgAGcTGTT	TCTGA (SEQ ID NO: 70)	

FIG. 24

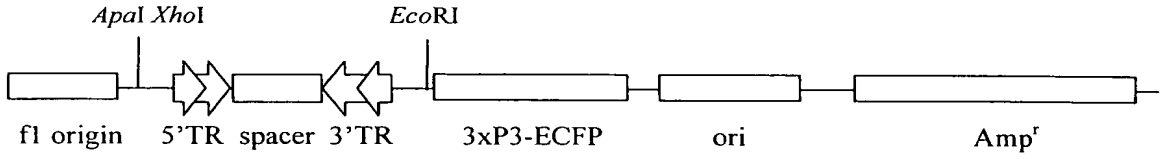
A. pCaSpeR-hs-orf



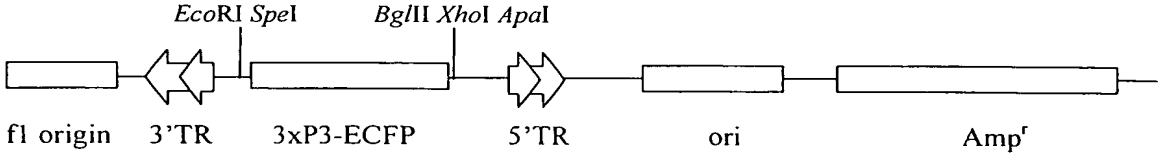
B. p(PZ)-Bac-EYFP



C. pBSII-ITR1.1k-ECFP

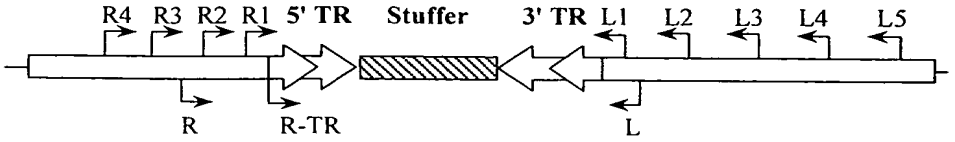


D. pXL-BacII-ECFP



pIAO-P/L-589bp

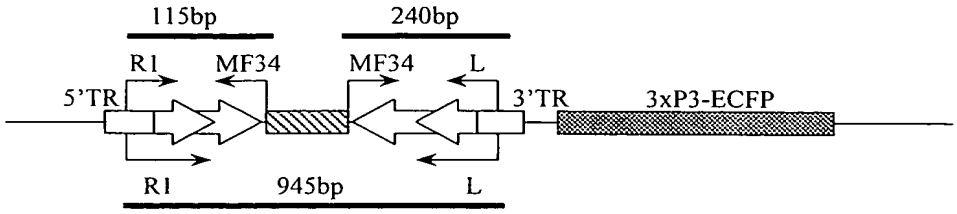
FIG. 25



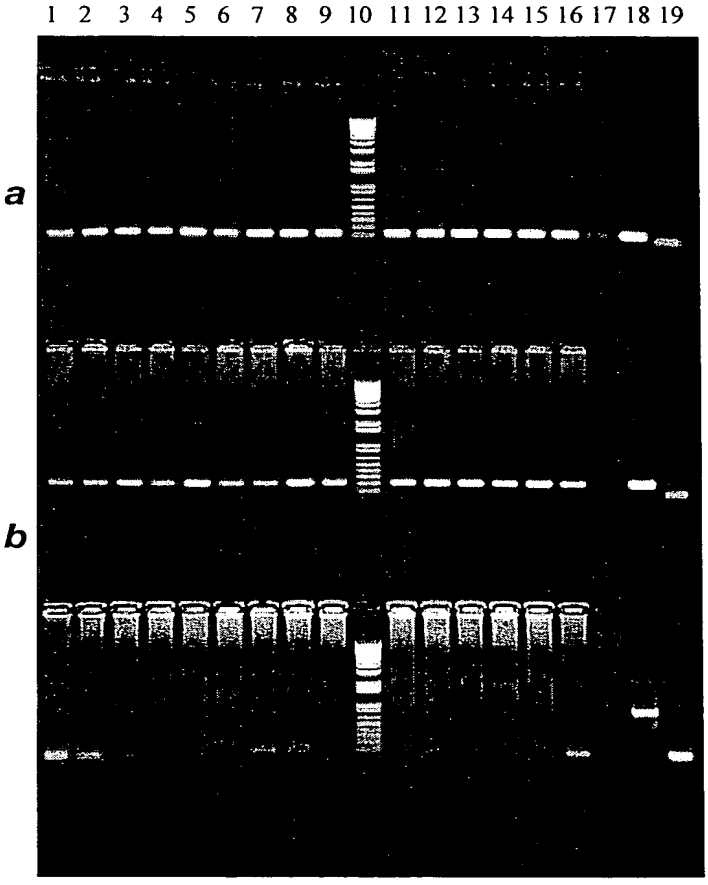
		Transformation Frequency
p(PZ)-Bac-EYFP	35bp, 63bp	0.6%
pBSII-ECFP-R1/L5	101bp (66+35), 1018bp (63+955)	8.9%
pBSII-ECFP-R2/L5	276bp (241+35), 1018bp (63+955)	12.5%
pBSII-ECFP-R3/L5	419bp (384+35), 1018bp (63+955)	15.0%
pBSII-ECFP-R4/L5	567bp (542+35), 1018bp (63+955)	12.9%
pBSII-ECFP-R4/L4	567bp (542+35), 882bp (63+819)	10.7%
pBSII-ECFP-R4/L3	567bp (542+35), 649bp (63+586)	9.7%
pBSII-ECFP-R4/L2	567bp (542+35), 441bp (63+378)	10.8%
pBSII-ECFP-R4/L1	567bp (542+35), 188bp (63+125)	0%
pBSII -ITR1.1K-ECFP	311bp (276+35), 235bp (63+172)	13.9%
pBSII-ECFP-R-TR/L	35bp, 235bp (63+172)	0%
pBSII-ECFP-R1/L	101bp (66+35), 235bp (63+172)	0%
pBS-pBac/DsRed	37bp (2+35), 99bp (63+36)	0%
pBac{3xP3-ECFPafm}	674bp (639+35), 1050bp (63+987)	12.9%

FIG. 26

A



B



a: PCR using IFP2_R1 + MF34

b: PCR using IFP2_L + MF34

c: PCR using IFP2_R1 + IFP2_L

Lane 1-5: pBSII-ITR1.1K-ECFP

Lane 6-7: pBSII-ECFP-R1/L5

Lane 8-9: pBSII-ECFP-R2/L5

Lane 10: 1KB plus ladder (Invitrogen)

Lane 11: pBSII-ECFP-R3/L5

Lane 12: pBSII-ECFP-R4/L5

Lane 13: pBSII-ECFP-R4/L4

Lane 14: pBSII-ECFP-R4/L3

Lane 15: pBSII-ECFP-R4/L2

Lane 16: M23.1 *piggyBac* strain

Lane 17: w^{1118} white eye strain

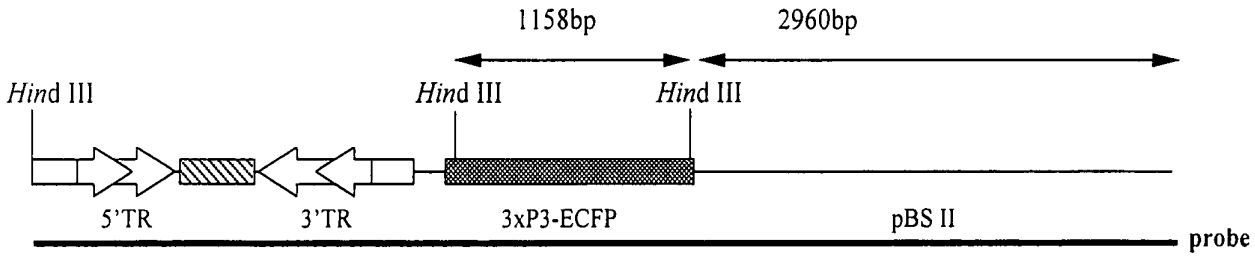
Lane 18: pBSII-ITR1.1K-ECFP plasmid

Lane 19: No DNA

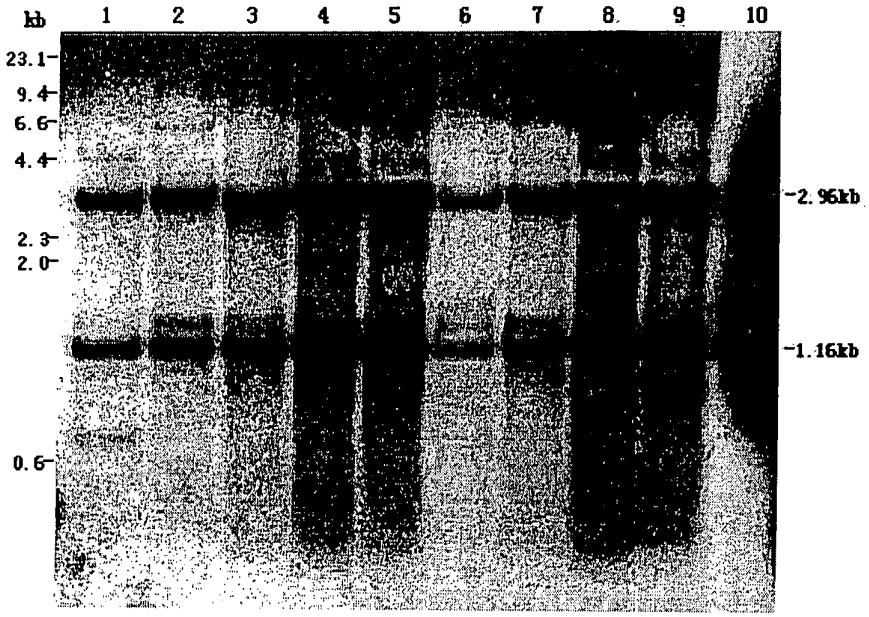
FIG. 27

Southern Hybridization of the transformed strains

A.



B.



Lane 1: pBSII-ITR1.1k-ECFP-1

Lane 2: pBSII-ITR1.1k-ECFP-3

Lane 3: pBSII-ECFP-R1/L5

Lane 4: pBSII-ECFP-R2/L5

Lane 5: pBSII-ECFP-R3/L5

Lane 6: pBSII-ECFP-R4/L5

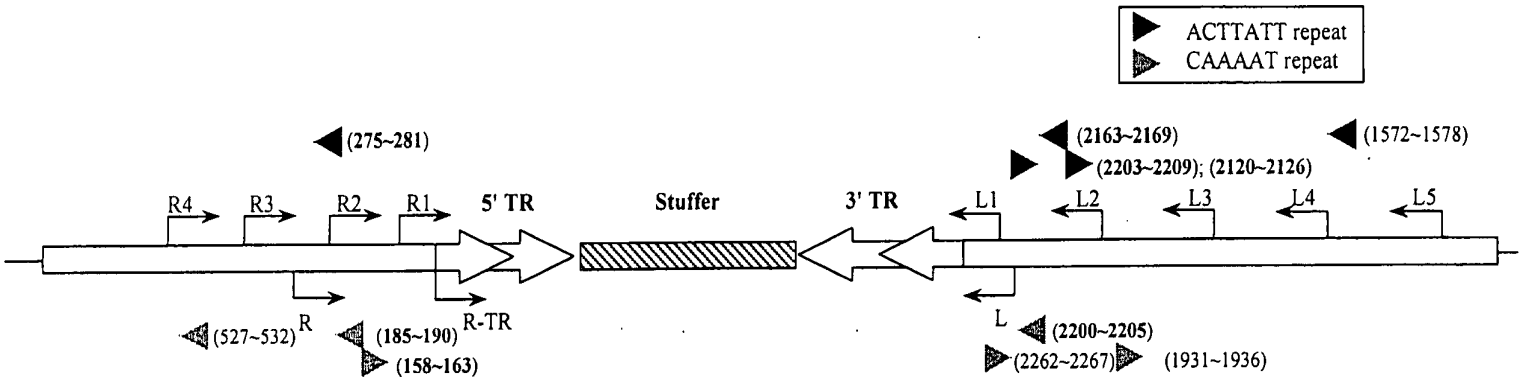
Lane 7: pBSII-ECFP-R4/L4

Lane 8: pBSII-ECFP-R4/L3

Lane 9: pBSII-ECFP-R4/L2

Lane10: pBSII-ITR1.1k-ECFP (plasmid)

FIG. 28


ACTTATT repeat
CAAAAT repeat
(275~281)
(2163~2169)
(1572~1578)
(2203~2209); (2120~2126)
R4
R3
R2
R1
5' TR
Stuffer
3' TR
L1
L2
L3
L4
L5
(527~532)
R
(185~190)
R-TR
(158~163)
L
(2200~2205)
(2262~2267)
(1931~1936)